THE PRACTITIONER'S

READY REFERENCE BOOK.

A HANDY GUIDE IN OFFICE AND BEDSIDE PRACTICE.

BY

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PREFACE TO THE THIRD EDITION.

The demand for a third edition of this work, after so brief an interval, would seem to imply that the object of the author in endeavoring to supply a volume of almost hourly reference for the practitioner has been fully appreciated. In the preparation of this new edition he has made numerous additions and alterations which he believes will materially increase its value.

Among the subjects now introduced for the first time, or so thoroughly revised as to possess the freshness of novelty, the following may be particularly mentioned:—

- Tables of Doses of Remedies (enlarged and adapted to the Pharmacopœia of 1880).
- Pharmacopœial Groups from the Pharmacopœia of 1880, Simplified for Ready Reference.
- Nutritive Enemata (New Formulæ).
- New and Carefully Selected Prescriptions.
- How to Prevent the Spread of Smallpox.
- Tables of Differential Diagnosis.
- How to Apply Bandages.
- How to Apply Immediate Relief in Recent Accidents or Sudden Illness.
  - Arrest of Hemorrhage; Treatment of Wounds; Immediate Treatment of Fractures.
  - Treatment of Foreign Bodies in the Eye and Ear.
  - Treatment of Burns and Scalds, and Bites of Rabid and other Animals.
  - Treatment of Frostbite, Sprains, Spitting of Blood, Insensibility, Suffocation, and Sunstroke.
- Suggestions for the Nursing of the Sick.
  - How to Make Poultices; How to Apply Blisters, Fomentations, and Leeches.

Suggestions for the Nursing of the Sick.
Vapor Baths; How to Lift Helpless Patients; How to Change Bed Linen for the Sick.
How to Remove the Injured or Sick by Bearers or Stretchers.
The Collection of Data at Autopsies; How to Preserve the Record of an Autopsy; Instructions for Making Measurements at an Autopsy.

Every addition which has now been made to the text has been with the view of practical utility.

RICHARD J. DUNGLISON.

PHILADELPHIA,
April, 1883.

PREFACE TO THE SECOND EDITION.

THE very favorable reception accorded to the first edition of this work by those whom it was specially intended to aid—professional men in active practice—has induced the author to endeavor to render it still more worthy of their attention by the addition of numerous important practical chapters. So voluminous have these additions been, that the second edition of the PRACTITIONER'S REFERENCE BOOK is now nearly one-half larger than its predecessor. Among the most useful chapters introduced in this edition may be mentioned the following:—

How to Write Metric Prescriptions.
Directions as to the Use of the Hypodermic Syringe in Diseases in which it is applicable.
How to Use a Galvanic Battery in Medicine and Surgery.
How to Apply Trusses to Herniæ.
How to Use the Clinical Thermometer.
How to Prepare Stained Sections of Animal Tissues.
Reference Tables of Size, Weight, and Specific Gravity of all the organs, etc., in the body.
Celebrated Prescriptions or Remedies.
Therapeutics of the Bowel Affections of Children.
Diagnostic Tables of the Principal Fevers.
Diagnostic Tables of Acute Pulmonary Diseases.
Diagnostic Tables of Diseases of the Larynx and Naso-pharynx.
Diagnostic Syllabus of Tumors of the Groin.
Ready Reference Table of Antidotes, on a new plan.
Rules of Medical Etiquette, etc. etc.

RICHARD J. DUNGLISON.

PHILADELPHIA,
June 1, 1880.

PREFACE TO THE FIRST EDITION.

From personal experience of the wants of the busy practitioner, the author is confident that a work of ready reference containing, in a compact and tangible shape, information of a purely practical character, will prove a desirable addition to his medical armamentarium. The physician is frequently at a loss to know in what direction to look, in order to procure such facts and hints as are here collected, some of which are widely scattered through voluminous professional treatises or the—in many instances—inaccessible pages of medical periodicals; while the other original suggestions and precepts offered for his guidance will, it is believed, meet many of his daily needs. The cordial indorsement of the objects of the work, with which the author has already been favored by leading and active members of the profession, induces him to indulge the hope that it may become an indispensable companion as a handy-book for every-day consultation.

RICHARD J. DUNGLISON.

Philadelphia,
May, 1877.

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WEIGHTS AND MEASURES.

THE study of Weights and Measures has now become one of the necessities as well as one of the accomplishments of the day. Those in common use are generally sufficiently well known for the ordinary purposes of the practitioner; but the day is not far distant when the French system will be so frequently employed, as the most convenient international standard, that the physician must be able to interpret it understandingly, if he wishes to keep abreast of the times in which he lives.[1]

Weights and Measures of the United States Pharmacopœia.

One Pound,	℔	=	12 Ounces	=	5,760 Grains.
One Ounce,	℥	=	8 Drachms	=	480 Grains.
One Drachm,	ʒ	=	3 Scruples	=	60 Grains.
One Scruple,	℈		. . . .	=	20 Grains.
One Grain,	gr.		. . . .	=	1 Grain.

One Gallon,	C	=	8 Pints	=	61,440 Minims.
One Pint,	O	=	16 Fluidounces	=	7,680 Minims.
One Fluidounce,	f℥	=	8 Fluidrachms	=	480 Minims.
One Fluidrachm,	fʒ		. . . .	=	60 Minims.
One Minim,	♏		. . . .	=	1 Minim.

[1] The tables of weights and measures here given are almost wholly based on those published in the last edition (1873) of the U. S. Pharmacopœia.

Relation of Weights and Measures of the U. S. Pharmacopœia to each other.

In distilled water at a temperature of 60°.

One Pound	=	0.7900031 Pint	=	6,067.2238 Minims.
One Ounce	=	1.0533376 Fluidounces	=	505.6019 Minims.
One Drachm	=	1.0533376 Fluidrachms	=	63.2002 Minims.
One Scruple		. . . .	=	21.0667 Minims.
One Grain		. . . .	=	1.0533 Minims.
One Gallon	=	10.1265427 Pounds	=	58,328.8862 Grains.
One Pint	=	1.2658178 Pounds	=	7,291.1107 Grains.
One Fluidounce	=	0.9493633 Ounce	=	455.6944 Grains.
One Fluidrachm	=	0.9493633 Drachm	=	56.9618 Grains.
One Minim		. . . .	=	0.9493 Grain.

Relation of Measures of the U. S. Pharmacopœia to Cubic Measure.

One Gallon	=	231.	Cubic Inches.
One Pint	=	28.875	Cubic Inches.
One Fluidounce	=	1.80468	Cubic Inches.
One Fluidrachm	=	0.22558	Cubic Inch.
One Minim	=	0.00375	Cubic Inch.

Weights and Measures of the Metrical System.

The metric or metrical system is intended to secure uniformity throughout the world in all measurements of length, weight, and capacity. The units selected, the *Metre*, *Gramme*, and *Litre*, are defined in the following tables. As the great majority of practitioners regard the metric system as one of very recent introduction, it will be appropriate here to give a short sketch of its history, showing that, though only now becoming popularized in different countries of the world, it has been for many years a subject of agitation.[1]

[1] This historical description and explanation of the metric system is taken from Photographic Mosaics, Philadelphia, 1877, article, Metric System, by H. A. Pintard.

This system of weights and measures was first adopted in France. In the absence of any other natural standard it was determined, at the period of the first Revolution, to adopt an aliquot part of the terrestrial meridian; and in 1799 a provisional measure was adopted, supposed to be the ten millionth of the quadrant, or the forty millionth of the whole circumference measured over the poles. A commission of the Academy of Sciences, consisting of five of the most eminent mathematicians of Europe—Borda, Lagrange, Laplace, Monge, and Condorcet—were subsequently appointed, under a decree of the Constituent Assembly, to report upon the selection of a natural standard, and Delambre and Méchain were selected to measure an arc of the meridian between the parallel of Dunkirk and Barcelona. This labor was begun at the most agitated period of the Revolution, and accomplished only after many difficulties and dangers, as the astronomers and geometricians who carried on the operations were frequently molested, being taken for spies or enemies of France. The result was a wonderful approximation of the true length, the error being only about $\frac{1}{5000}$ of the length, or less in a single metre than $\frac{1}{8000}$ of an inch. By means of the arc of the meridian measured between Dunkirk and Barcelona, and of the arc measured in Peru, in 1736, by Bouguer and La Condamine, the length of the quarter of the meridian, or the distance from the pole to the equator, was calculated. This length was then divided into ten millions of equal parts, and one of these parts was taken for the unit of length, and called a metre, from the Greek word *μέτρον* (a measure). The length of the metre as thus fixed is equal to 3.2808992 English feet, or very nearly 39.37079 English inches. From this unit of linear measure are derived all measures of length, surface, and solidity. The unit of long measure is therefore the *metre*,

and from it is derived land measure, by calling 100 square metres an *are*. The are equals 3.955 English perches.

Liquid measure is obtained by making the unit or standard a *litre*, equal in capacity to a cubic decimetre = 0.2617 English gallon; dry measure, by making the standard a *hectolitre* = 2 bushels and 3.35 pecks; while for solid measure the standard is a *stere*, equal to a cubic metre = 35.317 cubic feet English. Lastly, to complete the series, *weight* is allied to the metre, by making the kilogramme to correspond with the contents of a cubic vessel of distilled water at the temperature of 4° C., or slightly above melting ice, the side of which cube is the *tenth* part of a metre (the decimetre), and the gramme to answer to the contents of a cubic vessel, the side of which is the *hundredth* part of the metre (the centimetre); for the contents of all cubic vessels are to each other in a triplicate ratio of their sides (Euclid, 33, xi.). All these units, by the prefixes, deca, deci, hecto, milli, etc., become applicable to any weights and measures, and, as the multiple of 10 connects all the larger and smaller measures, the whole becomes susceptible of decimal computation. No system of metrology hitherto invented can compare with this of the French in a scientific point of view, whilst its convenience for the purposes of commerce cannot fail to obtain its adoption by all civilized nations. The system was declared obligatory in France after November 2, 1801, and it has since been adopted in Spain, Belgium, Portugal, Holland, Greece, Sweden, Mexico, Brazil, and in 1868 was made compulsory in the German Empire. It was also legalized in Great Britain in 1864, and in 1866 an act was adopted by the Congress of the United States, making it lawful, after the passage of the act, throughout the United States, to employ the weights and measures of the metric system. Another act authorizes in post-offices the use of

weights of the denomination of grammes. The decimal system is now employed almost to the exclusion of others in science, and the United States Coast Survey has adopted it in its work. As all the formulæ published in Continental journals are based on the metric system, the following tables will prove of value to those who may have occasion to use the processes of their foreign associates.

In order to express the decimal proportions, the following prefixes are used:—

Subdivision.

Latin	Milli (from	Millesimus),	meaning	a thousandth.
	Centi ("	Centesimus),	"	a hundredth.
	Deci ("	Decimus)	"	a tenth.

Multiples.

Greek	Deca, .	Ten.
	Hecto, .	One hundred.
	Kilo, .	One thousand.
	Myria, .	Ten thousand.

It may assist the memory to observe that the terms for multiplying are Greek, and those for dividing, Latin.

Measures of Length.

One Myriametre	=	10,000 Metres.
One Kilometre	=	1,000 Metres.
One Hectometre	=	100 Metres.
One Decametre	=	10 Metres.
One METRE[1]	=	the ten millionth part of a quarter of the meridian of the earth.
One Decimetre	=	the tenth part of one Metre, or 0.1 Metre.
One Centimetre	=	the hundredth part of one Metre, or 0.01 Metre.
One Millimetre	=	the thousandth part of one Metre, or 0.001 Metre.

[1] The unit of length.

Weights.

One Myriagramme	=	10,000 Grammes.
One Kilogramme	=	1,000 Grammes.
One Hectogramme	=	100 Grammes.
One Decagramme	=	10 Grammes.
One GRAMME[1]	=	the weight of a cubic centimetre of water at its maximum density, 4° C.
One Decigramme	=	the tenth part of one Gramme, or 0.1 Gramme.
One Centigramme	=	the hundredth part of one Gramme, or 0.01 Gramme.
One Milligramme	=	the thousandth part of one Gramme, or 0.001 Gramme.

Measures of Capacity.

One Myrialitre	=	10 cubic Metres, or the measure of 10 Milliers of water.
One Kilolitre	=	1 cubic Metre, or the measure of 1 Millier of water.
One Hectolitre	=	100 cubic Decimetres, or the measure of 1 Quintal of water.
One Decalitre	=	10 cubic Decimetres, or the measure of 1 Myriagramme of water.
One LITRE[2]	=	1 cubic Decimetre, or the measure of 1 Kilogramme of water.
One Decilitre	=	100 cubic Centimetres, or the measure of 1 Hectogramme of water.
One Centilitre	=	10 cubic Centimetres, or the measure of 1 Decigramme of water.
One Millilitre	=	1 cubic Centimetre, or the measure of 1 Gramme of water.

Relation of Weights of the U. S. Pharmacopœia to Metrical Weights.

A comparison between the metric system and that adopted in our own Pharmacopœia may also be made, exhibiting at a glanee the eonvertibility of one into the other. It is not probable that the whole of the French system will ever eome into common use; in other words, that the refinement of decimal division will ever be closely followed in the writing of prescriptions. If the prescriber

[1] The unit of weight. [2] The unit of capacity.

will restrict himself to the use of the gramme and the centigramme, or the gramme alone, to express integral and fractional quantities approximately, he will avoid the apparent confusion that seems to attend the employment of the decimal system to its minutest ramifications.

Fractions of a Grain in Milligrammes.

Grain.		Milligrammes.	Grain.		Milligrammes.
$\frac{1}{64}$	=	1.012	$\frac{1}{16}$	=	4.049
$\frac{1}{60}$	=	1.079	$\frac{1}{15}$	=	4.319
$\frac{1}{50}$	=	1.295	$\frac{1}{12}$	=	5.399
$\frac{1}{48}$	=	1.349	$\frac{1}{10}$	=	6.479
$\frac{1}{40}$	=	1.619	$\frac{1}{8}$	=	8.098
$\frac{1}{36}$	=	1.799	$\frac{1}{6}$	=	10.798
$\frac{1}{30}$	=	2.159	$\frac{1}{5}$	=	12.958
$\frac{1}{25}$	=	2.591	$\frac{1}{4}$	=	16.197
$\frac{1}{24}$	=	2.699	$\frac{1}{3}$	=	21.597
$\frac{1}{20}$	=	3.239	$\frac{1}{2}$	=	32.395

Grains in Equivalent Metrical Weights.

Grains.		Centigrammes.	Grains.		Grammes.
1	=	6.479	16	=	1.036
		Decigrammes.			
2	=	1.295	20	=	1.295
3	=	1.943	24	=	1.555
4	=	2.591	25	=	1.619
5	=	3.239	30	=	1.943
6	=	3.887	40	=	2.591
7	=	4.535	50	=	3.239
8	=	5.183	60	=	3.887
9	=	5.831			
10	=	6.479			
12	=	7.775			
15	=	9.718			

Drachms, Ounces, and Pounds in Equivalent Metrical Weights.

Drachms.		Grammes.	Ounces.		Hectogrammes.
1	=	3.887	4	=	1.2441
2	=	7.775	5	=	1.5551
		Decagrammes.			
3	=	1.166	6	=	1.8661
4	=	1.555	7	=	2.1772
5	=	1.943	8	=	2.4882
6	=	2.332	9	=	2.7992
7	=	2.721	10	=	3.1103
Ounces.			11	=	3.4213
			Pounds.		
1	=	3.1103	1	=	3.7324
2	=	6.2206	2	=	7.4648
					Kilogrammes.
3	=	9.3309	3	=	1.1197

Relation of Metrical Weights to Weights of the U. S. Pharmacopœia.

Metrical weights.		Exact equiv. in grs.	Approx. equiv. in grs.
Milligrammes.			
1	=	.0154	$\frac{1}{65}$
2	=	.0308	$\frac{1}{32}$
3	=	.0463	$\frac{1}{22}$
4	=	.0617	$\frac{1}{16}$
5	=	.0771	$\frac{1}{13}$
6	=	.0926	$\frac{1}{11}$
7	=	.1080	$\frac{1}{9}$
8	=	.1234	$\frac{1}{8}$
9	=	.1389	$\frac{1}{7}$
Centigrammes.			
1	=	.1543	$\frac{1}{6}$
2	=	.3086	$\frac{1}{3}$
3	=	.4630	$\frac{6}{13}$
4	=	.6173	$\frac{7}{11}$
5	=	.7717	$\frac{3}{4}$
6	=	.9260	$\frac{9}{10}$
7	=	1.0803	1
8	=	1.2347	$1\frac{1}{4}$
9	=	1.3890	$1\frac{1}{3}$
Decigrammes.			
1	=	1.543	$1\frac{1}{2}$
2	=	3.086	3
3	=	4.630	$4\frac{1}{2}$
4	=	6.173	6
5	=	7.717	$7\frac{1}{2}$
6	=	9.260	9
7	=	10.803	11
8	=	12.347	$12\frac{1}{2}$
9	=	13.890	14

Metrical weights.		Exact equivalents in grains.	Approximate equivalents, Troy weight.
Grammes.			
1	=	15.434	gr. xv.
2	=	30.868	ʒss.
3	=	46.302	℈ij.
4	=	61.736	ʒi.
5	=	77.170	℈iv.
6	=	92.604	ʒiss.
7	=	108.038	℈vss.
8	=	123.472	ʒij.
9	=	138.906	℈vij.
Decagrammes.			
1	=	154.340	ʒiiss.
2	=	308.680	ʒv.
3	=	463.020	ʒviiss.
4	=	617.360	ʒx.
5	=	771.701	ʒxiij.
6	=	926.041	ʒxv.
7	=	1,080.381	ʒxviij.
8	=	1,234.721	ʒxx.
9	=	1,389.062	ʒxxiij.
Hectogrammes.			
1	=	1,543.402	℥iij ℈v.
2	=	3,086.804	℥vj ʒiij.
3	=	4,630.206	℥ix ʒv.
4	=	6,173.609	℔i ʒvij
5	=	7,717.011	℔i ℥iv.
6	=	9,260.413	℔i ℥vij.
7	=	10,803.816	℔i ℥x ʒiv.
8	=	12,347.218	℔ij ℥i ʒv.
9	=	13,890.620	℔ij ℥v.
Kilogramme.			
1	=	15,434.023	℔ij ℥viij.
Myriagramme.			
1	=	154,340.23	℔xxvi. ℥ix ʒiv.

Relation of Measures of the U. S. Pharmacopœia to Metrical Measures.

One Gallon	=	3.785 Litres.
One Pint	=	4.732 Decilitres.
One Fluidounce	=	2.957 Centilitres.
One Fluidrachm	=	3.697 Millilitres.
One Minim	=	0.061 Millilitre.

Relation of Metrical Measures to Measures of the U. S. Pharmacopœia.

One Myrialitre	=	2641.9	Gallons.
One Kilolitre	=	264.19	"
One Hectolitre	=	26.419	"
One Decalitre	=	2.641	"
One Litre	=	2.113	Pints.
One Decilitre	=	3.381	Fluidounces.
One Centilitre	=	2.705	Fluidrachms.
One Millilitre (Cubic centimetre)	=	16.231	Minims.

Approximate Conversion of Ordinary Measures into Gramme Weights (Metric System).

As a matter of convenience in the writing of prescriptions containing fluid ingredients, the following table will be found of considerable importance for reference. As will be seen, it is arranged to include the estimated valuation, in the metric system, of menstrua or fluids of different densities, in quantities varying from a minim to four fluidounces. It forms a fitting sequel to the tables of weights and measures already given:—

Approximate Conversion of Measures into Gramme Weights.[1]

Apothecaries' measure.	Grammes for Liquids.		
Minims.	Lighter than water.[2]	Of the sp. gr. of water.[3]	Heavier than water.[4]
1	.055	.06	.08
2	.10	.12	.15
3	.16	.18	.24
4	.22	.24	.32
5	.28	.30	.40
6	.32	.36	.48
7	.38	.42	.55

[1] Amer. Journal of Pharmacy, Feb. 1877, p. 92, by Prof. J. M. Maisch, in continuation of an article in the same number, p. 49, chiefly in defence of the expression of liquid preparations by metric weights.

[2] Including spirits, tinctures prepared with alcohol, fixed and volatile oils.

[3] Including waters, fluid extracts, and tinctures prepared with diluted alcohol.

[4] Including glycerine and the syrups.

Apothecaries' measure.	Grammes for Liquids.		
	Lighter than water.	Of the sp. gr. of water.	Heavier than water.
Minims.			
8	.45	.50	.65
9	.50	.55	.73
10	.55	.60	.80
12	.65	.72	.96
14	.76	.85	1.12
15	.80	.90	1.20
16	.90	1.00	1.32
20	1.12	1.25	1.60
25	1.40	1.55	2.00
30	1.70	1.90	2.50
35	2.00	2.20	2.90
40	2.25	2.50	3.30
48	2.70	3.00	4.00
50	2.80	3.12	4.15
60 (fʒj)	3.40	3.75	5.00
65	3.60	4.00	5.30
72	4.05	4.50	6.00
80	4.50	5.00	6.65
90 (fʒiss)	5.10	5.60	7.50
96	5.40	6.00	8.00
100	5.60	6.25	8.30
120 (fʒij)	6.75	7 50	10.00
150 (fʒiiss)	8.50	9.50	12.50
160	9.00	10.00	13.30
180 (fʒiij)	10.10	11.25	15.00
210 (fʒiiiss)	11.80	13.00	17.50
240 (f℥ss)	13.50	15.00	20.00
fʒv	16.90	18.75	25.00
fʒvss	18.60	20.75	27.50
fʒvj	20.25	22.50	30.00
fʒvij	23.60	26.25	35.00
fʒviij (f℥j)	27.00	30.00	40.00
fʒix	30.40	33.75	45.00
fʒx	33.75	37.50	50.00
fʒxij (f℥iss)	40.50	45.00	60.00
fʒxiv	47.25	5‘ 50	70.00
f℥ij	54.00	60.00	80.00
f℥iiss	67.50	75.00	100.00
f℥iij	81.00	90.00	120.00
f℥iiiss	94.50	105.00	140.00
f℥iv	108.00	120.00	160.00

Conversion of Cubic Centimetres into Fluidrachms.

The following approximate table is based on the fact that a millilitre, or a cubic centimetre, is the measure of one gramme of water. To assist in the conversion of cubic centimetres into fluidrachms and minims, the statement here given has been carefully prepared. The value of a millilitre or cubic centimetre (according to the U. S. Ph. 1873) is 16.231 minims.[1]

Table for Converting Cubic Centimetres into Fluidrachms.

Cubic Centimetres.	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.
	dr. m.	dr. m.	dr. m.	dr. m.	dr. m.	dr. m.	dr. m.	dr. m.	dr. m.	dr. m.
0	0	0 16	0 32	0 49	1 5	1 21	1 37	1 53	2 10	2 26
10	2 42	2 58	3 15	3 31	3 47	4 3	4 19	4 36	4 52	5 8
20	5 24	5 41	5 57	6 13	6 29	6 46	7 2	7 18	7 34	7 51
30	8 7	8 23	8 39	8 56	9 12	9 28	9 44	10	10 17	10 33
40	10 49	11 5	11 22	11 38	11 54	12 10	12 27	12 43	12 59	13 15
50	13 31	13 48	14 4	14 20	14 36	14 53	15 9	15 25	15 41	15 58
60	16 14	16 30	16 46	17 2	17 19	17 35	17 51	18 7	18 24	18 40
70	18 56	19 12	19 28	19 44	20 1	20 17	20 34	20 50	21 6	21 22
80	21 38	21 55	22 11	22 27	22 43	23	23 16	23 32	23 48	24 4
90	24 20	24 37	24 53	25 9	25 26	25 42	25 58	26 14	26 31	26 47

100 cubic centimetres are equal to 27 fluidrachms 3 minims, or 3 fluidounces 3 fluidrachms and 3 minims.

[1] Alfred B. Taylor, *Med. and Surg. Reporter*, Feb. 24, 1877, suggests that, as the cubic centimetre, or gramme of distilled water, represents nearly $16\frac{1}{4}$ minims, and differs but slightly from the one-fourth part of a fluidrachm, or 15 minims, it might very appropriately and suggestively be designated a "fluigram," being required only for medicinal uses, and being directly related to the assumed standard weight of pharmacy. Four of these "fluigrams" represent a capacity of 64.9 minims, or not quite 5 minims more than our fluidrachm, which, translated into the "vulgate," signifies 5 drops over the average teaspoonful.

How to Write Metric Prescriptions.[1]

In writing prescriptions it is sufficiently accurate and safe to consider 1 gramme as exactly equal to 15 troy grains, and to consider 1 cubic-centimetre as equal to 15 minims.

We accordingly have:—

1 gramme equal to $\frac{15}{1}$ troy grains.
1 troy grain equal to $\frac{1}{15}$ gramme.
1 cubic-centimetre equal to $\frac{1}{4}$ fluidrachm.
1 fluidrachm equal to $\frac{4}{1}$ cubic-centimetre.

Hence—

1. To CONVERT TROY GRAINS INTO GRAMMES, OR MINIMS INTO CUBIC CENTIMETRES: a. *Divide by* 10, *and from the quotient subtract one-third;* or, b. *Divide by* 15.

2. To CONVERT APOTHECARIES' DRACHMS INTO GRAMMES, OR FLUIDRACHMS INTO CUBIC-CENTIMETRES, *multiply by* 4.

In writing prescriptions the "gramme" (abbreviated "Gm.") and "cubic-centimetre," (abbreviated "C. C.," which may be called "fluigramme," and written "f Gm") only, should be used.

The centigramme, a convenient unit in medicine and pharmacy, is used in books, but not in prescriptions.

All other terms, and units, and prefixes, used in the metric system, may be wholly ignored by the physician and pharmacist.

℞. Hydrarg. chloridi corros.	0	25 Gm.
Potassii iodidi	10	00 Gm.
Aquæ	100	00 C. C.
Tinct. cinch. comp.	100	00 C. C.
Mix.		

The use of a decimal line prevents possible errors.

To write a prescription for fifteen doses of any medicine, write it first for *one* dose in *grains* and *minims*, and then substitute the same number of "grammes" and "cubic-centimetres," thus:—

[1] From a paper on Metric or French Decimal System of Weights and Measures. By O. Oldberg, Phar.D., Med. Purveyor, U. S. Marine Service.

℞. Opii	gr. i.
Camphoræ	gr. ij.

and to get fifteen such doses in metric terms, write:—

℞. Opii	1 Gm.
Camphoræ	2 Gm.
Make fifteen pills.	

The gramme and the cubic-centimetre (*fluigramme*), when referring to liquids, may be considered as equal quantities, unless the liquids be very heavy (as in the case of chloroform) or very light (as in the case of ether).

Measures may be discarded and weights exclusively employed, if preferred. All quantities in a prescription would then be expressed in grammes.[1]

The average "DROP" (water) may be considered equal to 0.05 *C. C.*, or 0.05 *Gm.* An average TEASPOON holds 5 *C. C.*, and an average TABLESPOON 20 *C. C.* Decimal numbers should be used as far as practicable without sacrifice of accuracy as to strength and dose of the preparation. It is safe to prescribe 30 *Gm.* for one troy ounce, and 250 *C. C.* for eight fluidounces.

The above contains ALL THAT IT IS NECESSARY TO KNOW OR LEARN of the metric system IN ORDER TO WRITE METRIC PRESCRIPTIONS with or without a metric posological table.

To become familiar with the system, the rules previously given for the conversion of Apothecaries' into metric weights and measures, may be profitably used.

[1] As any liquid medicine must necessarily be administered to the patient in *measured*, and not in *weighed* doses, it will of course be more convenient to the physician to continue to make use of fluid measures in writing prescriptions, especially as he is already accustomed to this, and would not then have to bear in mind the specific gravity of *any* liquid ingredient in the prescription. To the pharmacist it makes but little difference, as he will have both weights and measures, and can use one or the other, as may be directed. If the physician discards measures, he must, of necessity, adjust the proportion in his formula to produce a mixture of which after all the dose must be a "teaspoonful," or other convenient measure, and this is as unnecessary as it is difficult.—O. O.

Number of Drops in a Fluidrachm.

The importance of becoming familiar with the relation of the drop to the fluidrachm is at once evident by an inspection of the following table. The wide range between the smallest number of drops (44) in one of the fluids cited, and the largest number (276), suggests to the practitioner the exercise of very great caution in the administration of medicines calculated *guttatim*. In writing prescriptions based on an estimate of a certain number of drops to each dose, serious error might be committed in the employment of a large number of the potent articles here enumerated, by a blind adherence to the view that any average number of drops is equivalent to a fluidrachm. The only true course for the practitioner is to make a special study of these agents, as offered in some such table as that here furnished, and to endeavor to fix in his mind the relative tenuity of the liquid articles he may desire to prescribe.

	From bottles.[1]	From minim measure.
Acetum colchici	75	
" destillatum	78	
" opii	90	69
" scillæ	78	
Acidum aceticum	73	102
" hydrocyanicum	53	52
" " dilutum	45	
" muriaticum	54	
" nitricum	84	
" " dilutum	62	44
" sulphuricum	90	
" " aromaticum	116	148
" " dilutum	54	49

[1] According to measurements by Durand, Procter, Parrish, Farquharson, and others. Some of these measurements are from ordinary bottles, others from Oj tincture bottles. Such a table is merely an approximate one, not absolutely exact under all circumstances.

	From bottles.	From minim measure.
Æther	150	
Alcohol	118	143
" dilutum	98	124
Aqua	64	46
" ammoniæ	49	62
Creasotum	91	95
Chloroformum	180	276
Glycerina	55	85
Liquor iodinii compositus	75	75
" hydrargyri et arsenici iodidi . .	52	52
" potassii arsenitis	60	63
Oleum amygdalæ dulcis	120	
" anisi	85	86
" carui	106	108
" caryophylli	103	103
" chenopodii	97	100
" cinnamomi	100	102
" cubebæ	86	96
" fœniculi	103	103
" gaultheriæ	102	101
" menthæ piperitæ	103	109
" " viridis	89	94
" olivæ	76	99
" ricini	55	
" rosmarini	104	105
" sabinæ	102	108
" sassafras	102	100
" terebinthinæ	110	
" tiglii	80	92
Spiritus ætherisnitrosi	90	148
" " compositus	90	140
Syrupus acaciæ	58	56
" scillæ	85	88
Tinctura aconiti	118	130
" assafœtidæ	120	
" digitalis	120	114
" ferri chloridi	106	151
" guaiaci	120	
" iodinii	144	113
" opii	147	106

	From bottles.	From minim measure.
Tinctura opii camphorata	110	95
" tolu	138	120
Vinum antimonii	87	62
" colchici	75	
" opii	92	78

As this table does not include a number of liquid preparations, which are also in common use, it is desirable that the practitioner should possess general rules for his guidance:—

1. Liquids which contain a small proportion of water afford a small drop; while, on the contrary, liquids containing a large quantity of water furnish a large drop. For instance, concentrated acids, ethers, rectified alcohol, fixed and essential oils, etc., which contain but a very small proportion of water, yield a smaller drop than diluted acids, weak alcohol, wine, vinegar, etc.

2. Amongst the liquids containing a large proportion of water, those which are not charged with remedial substances give a larger and heavier drop than these same liquids containing extraneous bodies in solution. Thus, weak alcohol, wine, vinegar and water furnish a larger and heavier drop than the tinctures prepared from them.[1]

Relative Value of the Drop and Minim.

The view, so long entertained and even loosely taught, that the *minim* was usually to be accepted as synonymous with the *drop*, has been wholly abandoned in the light of modern experimental research. Sixty minims always, of course, constitute a fluidrachm, but sixty drops are seldom equivalent to the same measurement, as may be deduced from the table just given. The fact becomes of vital importance in the calculation of quantities in prescription-

[1] E. Durand, Journal Phila. Col. of Pharmacy, i. 168.

writing, as in ignorance of this relative valuation of the drop a larger dose may be ordered than is desired by the practitioner, or than the welfare of the patient demands.

Approximate Measurements.

With the varying dimensions of teaspoons, tablespoons, wineglasses, etc., depending on the caprices of fashion or the fanciful manipulation of the silversmith or the glass-maker, no absolutely exact quantity can be fixed upon as the definite contents of any one of these articles. Custom, not law, has decided only approximately the measurement of each, and the practitioner can merely indicate, in a general way, the dose which he wishes to be administered to his patient, although the latter's modern teaspoon may sometimes be nearly as large again as the old-fashioned ones of his ancestors. A wineglassful is a very uncertain quantity, but when such a dose is employed, it is usually that of an infusion or decoction, which does not require absolutely exact measurement of the dose. Indeed this quantity is comparatively seldom prescribed in the United States, not nearly so often as by some of our transatlantic brethren.

Teaspoonful	about	1 fluidrachm.
Dessertspoonful . . .	"	2 fluidrachms.
Tablespoonful	"	4 "
Wineglassful	"	1½ to 2 fluidounces.
Teacupful	"	4 "
Breakfastcupful . . .	"	6 to 8 "
Tumblerful	"	8 to 10 "
Thimbleful	"	¾ fluidrachm.
Pinch (of leaves or flowers), .	"	1 drachm, Troy.
Handful	"	10 drachms, Troy.

SOLUBILITY OF MEDICINES IN WATER, ALCOHOL, ETHER, GLYCERINE, ETC.

The practitioner is hardly sufficiently armed with a proper knowledge of the art of prescribing who is not informed as to the solubility of the substances which he is about to employ. The young prescriber, especially, is often embarrassed as to the effective solution of the articles he may wish to introduce into his prescription; shall it be an alcoholic or an aqueous solution, and, if so, is the substance soluble in one or the other, and are the other ingredients miscible with it?

Such are the questions he often asks himself, and the accompanying table, which includes all the prominent remedies, will supply the answer. Even those who are experienced prescribers and dispensers will find such a summary valuable for daily use. The table has been carefully prepared by the author from results arrived at in the researches of various undoubted authorities,[1] and offers the advantage of immediate and ready reference at the moment it is needed.

For much of the information here conveyed the practitioner might search his text-books in vain. The works on chemistry proper, of course, take no cognizance of the solubility of purely medicinal agents, and medico-chemical treatises content themselves with only a brief mention of the solvent powers of such a useful excipient as glycerine. There are many opportunities, indeed, for

[1] Pharmacopœia of the United States, 1873; United States Dispensatory, 14th edition, 1877; Frank H. Storer, First Outlines of a Dictionary of Solubilities of Chemical Substances, 1864; etc.

the employment of these solutions in glycerine, both externally and internally, which are neglected from the usual inaccessibility of such information.

No allusion is made in the following table of solubilities to such articles of the materia medica as give up only a portion of their virtues to alcohol, water, etc., leaving undissolved a considerable amount of residue. We shall allude to preparations formed in this way, such as tinctures, in another place. (See *Pharmacopœial Groups.*) Nor is mention made of the solubility of substances in acids, when such solution is really nothing less than actual decomposition or disintregration, sometimes amounting to the formation of a salt with totally different properties. The solvents referred to in the table are those which are of constantly recurring interest to the physician and the pharmaceutist, being those most commonly resorted to by the former in prescribing, and by the latter in compounding. The solvent powers of these menstrua—water, alcohol, ether, glycerine—are exerted in a discriminating way, for which we can offer no satisfactory explanation, some substances being soluble either in water or alcohol, while others of a somewhat similar chemical nature are insoluble in one or both of these fluids. Very few articles employed by the practitioner are wholly insoluble.

Solubility of Medicines in Water, Alcohol, Ether, Glycerine, etc.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Acacia	Soluble.	Soluble.	Insoluble.	Insoluble.	Insoluble in oils; soluble in dilute acids.
Acidum arseniosum . .	At 55°, a pint dissolves 293 grains of transparent variety; 92 of the opaque.	Dissolves 807 grains of both varieties.	......	......	100 parts of glycerine dissolve 20 parts.
" benzoicum . .	Soluble in 200 parts.	Soluble in 24 parts.	Soluble.	......	Soluble in fixed oils and alkaline solutions. 100 parts of glycerine dissolve 10 parts.
" carbolicum . .	Soluble in 20 to 33 parts, according to purity.	......	Soluble.	Soluble.	Soluble in acetic acid, in glycerine, in fixed and volatile oils.
" citricum . . .	Soluble in ¾ its weight.	Soluble in ½ its w'ght.	Soluble.	Insoluble.	
" gallicum . . .	Soluble in 100 parts.	Soluble in 3 parts.	Very soluble.	Slightly soluble.	Soluble in glycerine, gr. xl. to ʒj.
" lacticum . . .	Soluble.	......	Soluble.	Soluble.	
" oxalicum . . .	Soluble in 9 times its weight.	Soluble in its weight.	Moderately soluble.	Solub. with difficulty.	
" tannicum . . .	Very soluble.	......	Soluble.	Soluble.	Insoluble in fixed and volatile oils. 100 parts of glycerine dissolve 50 parts.
" salicylicum . .	Soluble in 600 parts.	Soluble in 150 parts.	Soluble.	Soluble.	
" tartaricum . .	Soluble in rather less than its weight.	Soluble in ½ its w'ght.	Soluble.	Insoluble.	

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Acidum valerianicum	Soluble in 30 parts.	...	Soluble.	Soluble.	Soluble in strong acetic acid.
Aconitia	Soluble in 150 parts.	Soluble in 50 parts.	Readily soluble.	Readily soluble.	Soluble in chloroform.
Alcohol amylicum	Sparingly soluble.	......	Soluble.	Soluble.	Soluble in essential oils.
Aloes	Partially soluble.	Soluble.	Soluble.		
Alumen	Soluble in 14 to 15 times its weight.	Soluble in $\frac{3}{4}$ its weight.	Insoluble.	......	100 parts of glycerine dissolve 40 parts.
Ammonii benzoas	Soluble.	......	Soluble.		
" bromidum	Soluble in 1.5 parts.	......	Soluble in 13 parts.		
" carbonas	Soluble in 4 times its weight.	Decomposed by boiling water.	Abundantly soluble in dilute alcohol, and in heated alcohol, sp. gr. 0.836.	......	100 parts of glycerine dissolve 20 parts.
" chloridum	Soluble in 3 parts.	Soluble in one part.	Moderately soluble in rectified spirit; sparingly so in absolute alcohol.	Insoluble.	100 parts of glycerine dissolve 20 parts.
" iodidum	Very soluble.	......	Very soluble.		
" valerianas	Very soluble.	......	Very soluble.		
Ammoniacum	Partially soluble.	......	Partly soluble.	Partly soluble.	Partly soluble in vinegar and alkaline solutions.
Amyl nitris	Insoluble.	......	Soluble.		
Amylum	Insoluble.	Soluble.	Insoluble.	Insoluble.	

Solubility of Medicines in Water, Alcohol, Ether, Glycerine, etc.—Continued.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Antimonii et potassii tartras	Soluble in 15 parts at 60°.	Soluble in 2 or 3 parts.	Insoluble; partially soluble in proof spirit.	......	100 parts of glycerine dissolve 5.5 parts.
Antimonium sulphuratum	Insoluble.				
Argenti nitras	Soluble in its own weight; when pure, wholly dissolved in distilled water.	......	Soluble.	Soluble.	Soluble in glycerine.
" oxidum	Slightly soluble.				
Arsenici iodidum	Very soluble.	......	Soluble in boiling alcohol.		
Atropia	Soluble in 300 parts at 60°.	......	Soluble in 8 parts.	Soluble in 25 parts.	Soluble in 50 parts of glycerine; in rather more than 3 parts of chloroform; 100 parts of olive oil dissolve 2.62 parts.
Atropiæ sulphas	Very soluble.	......	Very soluble.	Insoluble.	Insoluble in chloroform. 100 parts of glycerine dissolve 33 parts.
Balsamum tolutanum	......	......	Soluble.		
Barii chloridum	Soluble in $2\frac{1}{2}$ times its weight.	Soluble in its own weight.	Almost insoluble in absolute alcohol; soluble in rectified spirit.	Insoluble.	
Bismuthi subcarbonas	Insoluble.				

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Bismuthi subnitras . .	Very slightly soluble.	......	......	......	Soluble in strong acids and ammonia, sparingly so in fixed alkalies.
Brominium	Sparingly soluble.	......	Moderately soluble.	Soluble.	
Brucia	Soluble in 850 parts.	Soluble in 500 parts.	Very soluble.	Insoluble.	Insoluble in fixed oils; slightly soluble in volatile oils. 100 parts of glycerine dissolve 2.25 parts.
Cadmii iodidum . . .	Freely soluble.	......	Freely soluble.	Sparingly scluble in boiling ether.	
" sulphas	Very soluble.				
Caffeina	Soluble.	......	Soluble.	Soluble.	
Calcii bromidum . . .	Soluble iu twice its weight.	......	Soluble.		
" carbonas præcipitata	Insoluble.	......	Insoluble.	Insoluble.	
" chloridum . . .	Very soluble.	......	Soluble.		
" hypophosphis . .	Soluble in 6 parts.	......	Slightly soluble in diluted alcohol. Insoluble in officinal alcohol.		
" phosphas præcipitata	Insoluble.				

Solubility of Medicines in Water, Alcohol, Ether, Glycerine, etc.—Continued.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Calx	Soluble in about 700 times its weight at 60°.	Soluble in about 1300 parts.	Almost insoluble.	Insoluble.	
" chlorinata	Partially soluble.				
Camphor	Triturated with water, latter dissolves only 1000th part.	......	Alcohol takes up 75 per cent. of its weight. 100 parts of alcohol, sp. gr. 0.806, dissolve 120 parts at 50° Fah. (Berzelius).	Soluble.	Soluble in fixed and volatile oils, strong acetic acid, and diluted mineral acids; extremely soluble in chloroform.
" monobromated .	Insoluble.	......	Soluble.	Soluble.	
Cerii oxalas	Insoluble.	......	Insoluble.	Insoluble.	
Chloral	Soluble in its own weight of distilled water.	......	Soluble in absolute alcohol.	Soluble.	Insoluble in oil of turpentine, chloroform, bisulphide of carbon. Soluble in fixed oils.
Chloroformum . . .	Soluble in 100 parts.	......	Soluble.	Soluble.	
Cinchonia	Almost insoluble.	Soluble in 2500 parts.	Soluble in boiling alcohol.	Slightly soluble.	Slightly soluble in fixed and volatile oils. 100 parts of glycerine dissolve 0.3 part.
Cinchoniæ sulphas . . .	Soluble in 54 parts.	Moderately soluble.	Soluble.	Sparingly soluble.	100 parts of glycerine dissolve 6.78 parts.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Cinchonidia	Very sparingly soluble.	......	Soluble.	Sparingly soluble.	
Codeia	Dissolves 1.26 per cent.	Dissolves 5.9 per c.	Soluble.	Soluble.	Insoluble in alkaline solutions.
Copaiba	Insoluble.	......	Soluble in absolute alcohol.	Soluble.	Soluble in fixed and volatile oils and strong alkaline solutions.
Creasotum	Forms two solutions; 1 part creasote, 80 water, and 1 part water, 10 creasote.	......	Soluble.	Soluble.	Soluble in naphtha and bisulphide of carbon.
Creta præparata	Insoluble.	......	Insoluble.	Insoluble.	
Cupri acetas	Soluble in 14 parts.	......	Soluble in 13 parts of boiling alcohol.	Insoluble.	100 parts of glycerine dissolve 10 parts.
" subacetas	Decomposed by water.	......	Insoluble.		
" sulphas	Soluble in 4 parts.	Soluble in 2 parts.	Insoluble.	......	100 parts of glycerine dissolve 30 parts.
Cuprum ammoniatum	Soluble.				
Digitalinum	Insoluble.	......	Soluble in 12 parts of cold alcohol of 90 per cent.; in 6 parts boiling alcohol.	......	Very soluble in chloroform.
Ferri arsenias	Insoluble.	......	......	......	Dissolved by muriatic acid.
" bromidum	Soluble.				
" chloridum	Soluble.	......	Soluble.	Soluble.	

Solubility of Medicines in Water, Alcohol, Ether, Glycerine, etc.—Continued.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Ferri citras	Abundantly but slowly soluble.	Soluble.			
" et ammonii citras .	Soluble.	......	Almost insoluble.		
" " " sulphas	Soluble in 1.5 parts at 60°.	Soluble in less than its weight.			
" " " tartras .	Slowly soluble.	.....	Insoluble.	Insoluble.	
" " potassii " . .	Soluble in 4 parts.	......	Sparingly soluble.	......	100 parts of glycerine dissolve 8 parts.
" " quiniæ citras . .	Slowly soluble.	Soluble.	Insoluble in officinal alcohol.	Insoluble.	
" " strychniæ " . .	Very soluble.				
" ferrocyanidum . .	Insoluble.	......	Insoluble.	Insoluble.	
" hypophosphis . .	Insoluble.	.. ...	......	......	Soluble in hydrochloric acid.
" iodidum	Very soluble.	......	Very soluble.	......	Soluble in glycerine.
" lactas	Soluble in 48 parts.	Soluble in 12 parts.	Almost insoluble.	Insoluble.	100 parts of glycerine dissolve 16 parts.
" oxalas	Insoluble.				
" phosphas	Insoluble.	......	......	......	Soluble in acids.
" pyrophosphas . . .	Freely soluble.				
" subcarbonas . . .	Insoluble.				
" sulphas	Soluble in twice its weight.	Soluble in $\frac{3}{4}$ its w'ght.	Insoluble.	......	100 parts of glycerine dissolve 25 parts.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Ferrum redactum . . .	Insoluble.	Insoluble.	Insoluble.	Insoluble.	
Galla	......	Partially soluble.	Partially soluble.	Partially soluble.	
Glycerina	Soluble.	......	Soluble.	Insoluble.	
Gutta-percha	Insoluble.	......	Insoluble.	Imperfectly soluble by aid of heat.	Insoluble in alkaline solutions and in weak acids. Soluble in oil of turpentine, bisulphide of carbon, chloroform, and benzole.
Hydrargyri chloridum corrosivum	Soluble in 16 parts.	Soluble in 3 parts.	Soluble in 2.3 parts of cold, in its own weight of boiling alcohol.	Soluble in 3 parts of ether.	Soluble in sulphuric, nitric, and muriatic acids. 100 parts of glycerine dissolve 7.5 parts.
Hydrargyri chloridum mite	Insoluble.	......	Insoluble.	Insoluble.	
Hydrargyri cyanidum . .	Soluble.	Soluble.	Sparingly soluble.	......	100 parts of glycerine dissolve 27 parts.
Hydrargyri iodidum rubrum	Soluble in 150 parts.	......	Sparingly soluble.	Freely soluble.	Soluble in muriatic acid, solutions of iodide of potassium, chloride of sodium, etc.
Hydrargyri iodidum viride	Soluble in 2375 parts.	......	Insoluble.	Insoluble.	

Solubility of Medicines in Water, Alcohol, Ether, Glycerine, etc.—Continued.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Hydrargyri oxidum rubrum	Soluble in 20,000 parts.	Soluble in 7000 parts.	Insoluble.	Insoluble.	
Hydrargyri oxidum flavum	Soluble in 200,000 p'ts.				
" sulphas flava	Soluble in 2000 parts.	Soluble in 600 parts.			
" sulphuretum rubrum	Insoluble.	......	Insoluble		
Hydrargyrum ammoniatum	Insoluble.	......	Insoluble.	Insoluble.	
Hydrargyrum cum cretâ	Insoluble.				
Ichthyocolla	......	Soluble.	Insoluble.	...	Soluble in dilute acids and alkaline solutions.
Iodinium	Soluble in 7000 times its weight.	......	Soluble.	Very soluble.	100 parts of glycerine dissolve 1.9 parts. Soluble in chloroform.
Iodoformum	Insoluble.	......	Soluble.	Soluble.	Soluble in fixed and volatile oils.
Lithii carbonas	Soluble in about 100 parts.	......	Insoluble.	......	Soluble in carbonic acid water.
" citras	Soluble in 2.5 parts.				
Lupulina	Water dissolves 5 per cent. of its weight.	......	Soluble.	Almost insoluble.	
Magnesia	Soluble in 5142 parts at 60°.	Soluble in 36,000 p'ts.			

Name.	Cold water.	Boiling water.	Alcohol.	Ether	
Magnesii carbonas . . .	Soluble in 2493 parts.	Soluble in 9000 parts of hot water.			
" sulphas . . .	At 32° F. 100 parts of water dissolve 25.76 parts of anhydrous salt, and nearly 0.86 part for every additional degree.	......	Insoluble.		
Manganesii sulphas . .	When anhydrous, dissolved by 2 parts at 60°.	Soluble in its own weight.	Insoluble.	Insoluble.	
Manna	Soluble in 3 parts.	Soluble in its own weight.	Soluble.		
Morphia	Nearly insoluble.	Soluble in rather less than 100 parts.	Slightly soluble in cold, freely in boiling, alcohol.	Slightly soluble.	Soluble in fixed and volatile oils; insoluble in chloroform. 100 parts of glycerine dissolve 0.45 part.
Morphiæ acetas	Soluble when pure.	......	Moderately soluble.	......	100 parts of glycerine dissolve 20 parts.
" murias . . .	Soluble in 16 parts at 60°.	Soluble in its own weight.	Soluble.	......	100 parts of glycerine dissolve 20 parts.
" sulphas . . .	Soluble in twice its weight.	......	Soluble.		

Solubility of Medicines in Water, Alcohol, Ether, Glycerine, etc.—Continued.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Myrrha	Partially soluble.	......	Partially soluble.	Partially soluble.	Soluble in solutions of the alkalies.
Oleum amygdalæ amaræ	Slightly soluble.	......	Soluble.	Soluble.	
" morrhuæ	Dissolves 0.637 to 1.28 per cent. of different varieties.	......	Dissolves 2.5 to 6 per cent. of different varieties.	Soluble.	
" olivæ	Insoluble.	......	Nearly insoluble.	Soluble in twice its volume.	Readily soluble in chloroform, benzine, and bisulphide of carbon.
" ricini	Insoluble.	......	Soluble in all proportions in cold absolute alcohol. Alcohol, sp. gr. 0.8425 takes up about $\frac{3}{5}$ of its weight.	Soluble.	
" terebinthinæ	Very slightly soluble.	......	Moderately soluble.	Readily soluble.	Soluble in volatile oils.
" tiglii	Insoluble.	....	Partially soluble.	Soluble.	Solnble in oil of turpentine.
Phosphorus	Insoluble.	......	Sparingly in anhydrous alcohol.	Sparingly soluble.	Sparingly soluble in the oils; abundantly so in bisulphide of carbon and chloroform. 100 parts of glycerine dissolve 0.20 part.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Piperina	Insoluble.	Slightly soluble.	Soluble.	Soluble.	Soluble in acetic acid.
Plumbi acetas	Soluble in 4 times its weight; soluble in distilled water.	......	Soluble.	......	100 parts of glycerine dissolve 20 parts.
" carbonas	Almost insoluble.				
" iodidum	Soluble in 1235 parts.	Soluble in 194 parts.	Soluble.		
" nitras	Soluble in 7½ parts.	......	Slightly soluble.		
Potassa	Soluble in less than its weight.	......	Readily soluble.	Soluble.	Readily soluble in glycerine.
Potassii acetas	Soluble in half its weight.	......	Soluble in twice its weight.		
" bicarbonas	Soluble in 4 parts.	......	Insoluble.		
" bitartras	Soluble in 184 parts.	Soluble in 18 parts.	Insoluble.		
" bromidum	Very soluble.	......	Slightly soluble.	......	100 parts of glycerine dissolve 25 parts.
" carbonas	Soluble in its own weight.	......	Insoluble.		
" " pura	Soluble in its own weight.	......	Insoluble.		
" chloras	Soluble in 16 parts at 60°.	Soluble in 2½ parts.	Slightly soluble.	......	100 parts of glycerine dissolve 3.5 parts.
" citras	Soluble.	......	Insoluble.		
" cyanidum	Very soluble.	......	Moderately soluble.	......	100 parts of glycerine dissolve 32 parts.

Solubility of Medicines in Water, Alcohol, Ether, Glycerine, etc.—Continued.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Potassii ferrocyanidum .	Soluble in 3 or 4 times its weight.	Soluble in its own weight.	Insoluble.		.
" hypophosphis .	Very soluble.	......	Very soluble.	Insoluble.	
" iodidum . . .	Very soluble.	......	Soluble in $5\frac{1}{2}$ parts of alcohol, sp. gr. 0.85 at 55°.	.....	100 parts of glycerine dissolve 40 parts.
" nitras	Soluble in 4 or 5 times its weight.	Soluble in $\frac{2}{5}$ of its weight.	Sparingly soluble in rectified spirit; insoluble in absolute alcohol.	Almost insoluble.	
" permanganas . .	Soluble in 5 times its weight at ordinary temperatures.				
" et sodii tartras .	Soluble.	Soluble. in 5 times its weight.	Insoluble.		
" sulphas . . .	Slowly soluble in $9\frac{1}{2}$ times its weight.	Soluble in less than 4 times its weight.	Insoluble.	......	Soluble in glycerine.
" sulphis	Soluble in an equal weight.				
" sulphuretum . .	Soluble.	......	Soluble	......	Soluble in glycerine.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Potassii tartras	Soluble in its own weight.	Soluble in half its weight.	Nearly insoluble.		
Quiuia	Soluble in 400 parts.	Soluble in 250 parts.	Soluble.	Soluble.	Soluble in fixed and volatile oils. 100 parts of glycerine dissolve ½ part.
Quiuiæ sulphas	Soluble in 740 parts at 54°.	Soluble in 30 parts.	Soluble in 60 parts, sp. gr. 0.835.	Almost insoluble.	Slightly soluble in cold glycerine; freely so in hot.
" valerianas . . .	Soluble in 110 parts.	Soluble in 40 parts.	Soluble in 6 parts of cold alcohol, and in an equal weight of boiling alcohol.	Soluble.	
Resina jalapæ	Insoluble.	......	Soluble.	Partially soluble.	Insoluble in oil of turpentine.
" podophylli . . .	Insoluble.	......	Soluble.	Partially soluble.	Soluble in alkaline solutions; insolnble in oil of turpentine.
" scammonii . . .	Insoluble.	......	Very soluble; also in boiling proof spirit.	Very soluble.	
Saccharum	Soluble in half its weight.	Very soluble.	Nearly insoluble in absolute alcohol; soluble in 4 times its weight of boiling alcohol, sp. gr. 0.83.	Insoluble.	

Solubility of Medicines in Water, Alcohol, Ether, Glycerine, etc.—Continued.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Saccharum lactis	Slowly soluble in 6 parts.	Slowly soluble in 3 parts.	Slightly soluble.	Insoluble.	
Scammonium	Partially soluble.	......	Partially soluble; also in boiling dilute alcohol.	Partially soluble.	
Soda	Soluble.	......	Soluble.	Moderately soluble.	Soluble in glycerine.
Sodii acetas	Soluble in 3 parts.	......	Soluble in 24 parts.		
" arsenias	Soluble in 2 parts.	......	Insoluble.	......	100 parts of glycerine dissolve 50 parts.
" bicarbonas	Soluble in 13 parts.	Decomposed.	......	......	100 parts of glycerine dissolve 8 parts.
" boras	Solublo in 12 times its weight.	Solublo in twice its weight.	Nearly insoluble.	......	100 parts of glycerine dissolve 60 parts.
" bromidum	Soluble.	......	Sparingly soluble.		
" carbonas	100 parts dissolve 60 parts at 57°.	100 parts dissolve 445 parts at 219°.	Insoluble.	......	100 parts of glycerine dissolve 98 parts.
" chloridum	At 54° water dissolvos 36 per cent.	Dissolves 40 per cent.	100 parts of alcohol, sp. gr. 0.815, dissolve, at 59°, only 0.174 part.	......	Soluble in glycerine.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Sodii hypophosphis . .	Very soluble.	……	Very soluble in absolute alcohol.	Insoluble.	
" hyposulphis . . .	Soluble in 1½ parts at 60°.	……	Insoluble.		
" nitras	Soluble in about twice its weight of water at 60°.	……	Soluble in boiling alcohol.	……	Soluble in glycerine.
" phosphas	Soluble in 4 parts.	Soluble in 2 parts.	Insoluble.		
" sulphas	Soluble in 3 times its weight.	Soluble in its own weight.	Insoluble.	……	Soluble in glycerine.
" sulphis	Soluble in 4 parts.	Soluble in less than its weight.	Insoluble.		
" sulphocarbolas . .	Soluble.				
Strychnia	Soluble in 6667 parts at 50°.	Soluble in 2000 parts.	Soluble in 387 parts officinal alcohol sp. gr. 0.835; more soluble in boiling alcohol; soluble in 179 parts of absolute alcohol.	Soluble in 682 parts.	Soluble in chloroform and volatile oils. 100 parts of olive oil dissolve 1 part. 100 parts of glycerine dissolve 0.25 part.
Strychniæ sulphas . . .	Freely soluble.	……	Sparingly soluble.	Insoluble.	100 parts of glycerine dissolve 22.5 parts.
Sulphur præcipitatum .	Insoluble.	……	Slightly soluble.	Slightly soluble.	

Solubility of Medicines in Water, Alcohol, Ether, Glycerine, etc.—Concluded.

Name.	Cold water.	Boiling water.	Alcohol.	Ether.	
Sulphur sublimatum . .	Insoluble.	......	Slightly soluble.	Slightly soluble.	Soluble in alkaline solutions, petroleum, rectified coal naphtha, fixed oils, oil of turpentine, and other volatile oils, chloroform and bisulphide of carbon. 100 parts of glycerine dissolve 0.10 part.
Sulphuris iodidum . . .	Insoluble.	......	Decomposed by alcohol.	......	Soluble in 60 parts of glycerine.
Veratria	Almost insoluble.	Soluble in 1000 parts.	Soluble in 11 parts of alcohol, sp. gr. 0.847.	Soluble in 6 parts.	100 parts of olive oil dissolve 1.78 parts. 100 parts of glycerine dissolve 1 part.
Zinci acetas	Very soluble.	......	Moderately soluble in rectified spirit.		
" carbonas præcipitata	Almost insoluble.				
" chloridum . . .	Partly soluble.	......	Soluble.	Soluble.	100 parts of glycerine dissolve 50 parts.
" oxidum	Insoluble.	......	Insoluble.		
" sulphas	Soluble in $2\frac{1}{2}$ times its weight.	Soluble in less than its weight.	Insoluble.	......	100 parts of glycerine dissolve 35 parts.
" valerianas . . .	Soluble in 160 parts.	......	Soluble in 60 parts of alcohol sp. gr. 0.833.		

ABBREVIATIONS IN COMMON USE.

The practitioner will frequently have occasion to employ some of the following abbreviations in his prescriptions, while others confront him in the course of his medical reading. They are generally derived from the Latin:—

℞ (*Recipe*). Take.

Aa (*ana*). Of each.

Abd. Abdomen.

Abs. febr. (*absente febre*). In the absence of fever.

Ad. To (as, ad f℥iij, sufficient to amount to three fluidounces).

Ad. or adde. Add or let there be added.

Ad deliq. (*ad deliquium*). To fainting.

Ad lib. (*ad libitum*). At will or pleasure.

Altern. hor. (*alternis horis*). Every other hour.

Ana. Of each.

Aq. (*aqua*). Water. Aqua callida. Warm water.

Aq. bull. (*aqua bulliens*). Boiling water.

Aq. dest. (*aqua destillata*). Distilled water.

Aq. ferv. (*aqua fervens*). Hot water.

Aq. fluv. (*aqua fluvialis*). River water.

Aq. font. (*aqua fontis* or *fontana*). Spring water.

Aq. marin. (*aqua marina*). Sea water.

Aq. pluv. (*aqua pluvialis*). Rain water.

Baln. aren. or B. A. (*Balneum arenæ*). Sand-bath.

Bals. (*balsamum*). Balsam.

Bib. (*bibe*). Drink.

Bis ind. (*bis indies*). Twice a day.

Bol. Bolus.

Bull. (*bulliens*). Boiling. (*Bulliat*). Let it boil.
C. (*congius*). A gallon.
C. or Cent. . Centigrade (thermometric scale).
Cap. (*capiat*). Let him take.
Chart. (*charta* or *chartula*). A powder.
Cochl. (*cochleare*). A spoonful.
Cochl. ampl. (*cochleare amplum*). A large spoonful.
Cochl. inf. (*cochleare infantum*). A child's spoonful.
Cochl. mag. (*cochleare magnum*). A tablespoonful.
Cochl. med. (*cochleare medium*). A dessertspoonful.
Cochl. mod. (*cochleare modicum*). A dessertspoonful.
Cochl. parv. (*cochleare parvum*). A teaspoonful.
Col. (*cola*). Strain or filter.
Collyr. (*collyrium*). An eye-wash.
Comp. (*compositus*). Compound.
Conf. (*confectio*). Confection.
Cont. (*continuetur*). Let it be continued.
Coq. (*coque*). Boil.
Cort. (*cortex*). Bark.
D. (*dosis*). Dose.
Decoct. (*decoctum*). Decoction.
Decub. (*decubitus*). Lying down.
Dej. alv. (*dejectiones alvi*). Passages from the bowels.
est. (*destillatus*). Distilled.
Det. (*detur*). Let it be given.
Dieb. altern. (*diebus alternis*). Every other day.
Dieb. tert. (*diebus tertiis*). Every third day.
Dig. (*digeratur*). Let it be digested.
Dil. (*dilutus*). Diluted. (*Dilue*). Dilute.
Dim. (*dimidius*). One-half.
Div. (*divide*). Divide.
Drach. (*drachma*). A drachm.
Elec. (*electuarium*). Electuary.
Enem. Enema.

Exhib. (*exhibeatur*). Let it be exhibited.
F. (*fiat*). Let it be made.
F. pil. (*fiat pilula*). Let a pill be made.
Fah. or Fahr. Fahrenheit (thermometric scale).
Feb. dur. (*febre durante*). The fever continuing.
Fl. (*fluidus*). Fluid. (*Flores*). Flowers.
Ft. (*fiat*). Let it be made.
Ft. haust. (*fiat haustus*). Let a draught be made.
Fract. dos. (*fractâ dosi*). In a broken dose.
Garg. (*gargarisma*). A gargle.
Gr. (*granum*). A grain.
Gt. (*gutta*). A drop.
Gtt. (*guttæ*). Drops.
Gum. (*gummi*). Gum.
Guttat. (*guttatim*). By drops.
Haust. (*haustus*). A draught.
Hor. decub. (*horâ decubitûs*). At bedtime.
H. S. (*horâ somni*). At bedtime.
Imp. meas. Imperial measure.
Ind. (*indies*). Daily.
Inf. (*infunde*). Infuse.
Infus. (*infusum*). Infusion.
Inj. (*injiciatur*). Let it be injected.
Lb. (*libra*). A pound.
Lib. (*libra* or *libræ*). A pound or pounds.
Llb. (*libræ*). Pounds.
Liq. (*liquor*). Solution.
M. (*misce*). Mix.
Mac. (*macera*). Macerate.
Mic. pan. (*mica panis*). Bread crumb.
Min. (*minimum*). Minim.
Mist. (*mistura*). Mixture.
Muc. (*mucilago*). Mucilage.
O. (*octarius*). A pint.

Ol. (*oleum*). Oil.
Ov. (*ovum*). An egg.
Ox. Oxymel.
Oz. (*uncia*). An ounce.
P. (*pondere*). By weight. (*Pars*). A part.
P. Æ. (*partes æquales*). Equal parts.
Ph. B. British Pharmacopœia.
Ph. D. Pharmacopœia of Dublin.
Ph. E. " " Edinburgh.
Ph. L. " " London.
Ph. P. " " Paris.
Ph. U. S. " " United States.
Pil. (*pilula* or *pilulæ*). A pill or pills.
Pill. (*pilulæ*). Pills.
P. R. N. (*pro re natâ*). As occasion may require.
Pulv. (*pulvis*). Powder.
Q. S. (*quantum sufficit*). As much as is sufficient.
R. Réaumur (thermometric scale).
Rad. (*radix*). Root.
Ras. (*rasuræ*). Shavings.
Rect. (*rectificatus*). Rectified.
Repet. (*repetatur*). Let it be repeated.
S. (*signa*). Write or direct.
S. A. (*secundum artem*). According to art.
Sem. (*semen*). Seed.
Semidr. (*semidrachma*). Half a drachm.
S. G. Specific gravity.
Signa. Write or direct.
Sing. (*singulorum*). Of each.
Solv. (*solve*). Dissolve.
Sp. and Spir. (*spiritus*). Spirits.
Sp. gr. Specific gravity.
Ss. (*semi*). A half.
St. (*stet*). Let it stand.

Syr. (*syrupus*). Syrup.
Tinct. (*tinctura*). Tincture.
Tr. or tra. (*tinctura*). Tincture.
Trit. (*tritura*). Triturate.
Troch. (*trochiscus*). A lozenge.
Usq. ad deliq. (*usque ad deliquium*). To fainting.
Vitel. ovi (*vitellus ovi*). Yolk of egg.
Vs. (*venæsectio*). Venesection.

COMPARISON OF THERMOMETRIC SCALES.

THE practitioner frequently meets with quotations from each of these scales in the course of his readings. It will therefore become necessary for him to convert the degrees of any one of them, as the centigrade, into one of the others, as the familiar scale of this country, that of Fahrenheit. He must bear in mind that the zero of the two scales—Centigrade and Réaumur—corresponds with the freezing point of water, or 32° on the Fahrenheit scale. The boiling point of water being respectively 100° on the Centigrade scale, 80° on that of Réaumur, and 212° on that of Fahrenheit, it will be seen that the degrees intervening between the two standard points of the scale amount to 100 on the Centigrade scale, 80 on that of Réaumur, and 180 on that of Fahrenheit. This establishes the following ratio of comparison of the three thermometers:—

$$180 : 100 : 80 :: 9 : 5 : 4.$$

When the Fahrenheit scale is in question, 32° must be added or subtracted, as is clearly shown in the accompanying table.

The following condensed rules[1] will facilitate the reader in making an accurate conversion of the scales:—

Rules for Conversion of Scales.

C. = Centigrade. F. = Fahrenheit.
D. = Degree cited. R. = Réaumur.

	If above freezing point of water (32° F., 0° C., 0° R.).	If below freezing point, and above zero F. (—17.77 C., —14.22 R.).	If below zero F. (—17 77 C., —14 22 R.).
C. into F.	D × 9 ÷ 5 + 32	32—(D × 9 ÷ 5)	—(D × 9 ÷ 5) —32
R. " F.	D × 9 ÷ 4 + 32	32—(D × 9 ÷ 4)	—(D × 9 ÷ 4) —32
F. " C.	D — 32 × 5 ÷ 9	—(32— D) × 5 ÷ 9	—(D + 32) × 5 ÷ 9
F. " R.	D — 32 × 4 ÷ 9	—(32— D) × 4 ÷ 9	—(D + 32) × 4 ÷ 9

C. " R. (all temperatures) D. × 4 ÷ 5.
R. " C. " " D × 5 ÷ 4.

[1] Attfield, Chemistry, 7th edition. Philadelphia, 1876.

REFERENCE TABLES OF SIZE, WEIGHT, AND SPECIFIC GRAVITY.[1]

I.—Size and Weight of different parts of the Body.

1. The Nervous System.

	Length.	Breadth.	Thickness.	Weight.	
Brain, Medulla	1¼ in.	1 in.	¾ in.	1 oz.	
Brain, Cerebellum	3½–4 in.	2½ in.	2 in.	5 ozs.	
Brain, Cerebrum	—	—	—	44 ozs.	
					50 ozs.
Spinal cord	17 in.	¾ in.	¾ in.		1½ oz.

2. The Digestive System.

a. *The Canal.*

	Length.	Breadth.	Weight.
Pharynx	4½ in.	—	—
Œsophagus	9 in.	—	—
Stomach	10-12 in.	4–5 in.	5 ozs.
Duodenum	12 in.	1½–2 in.	—
Jejunum	8 ft.	—	—
Ileum	12 ft.	—	—
Cæcum	2½ in.	2½ in.	—
Appendix vermif.	3–6 in.	—	—
Colon	5 ft.	—	—
Rectum	7 in.	—	—

[1] By John Barlow, M.B., McKendrick's "Outlines of Physiology."

b. *Glands connected with the Canal.*

	Length.	Breadth.	Thickness.	Weight.
Parotid . . .	—	—	—	5–8 drs.
Sublingual . . .	—	—	—	$2\frac{1}{2}$ drs.
Submaxillary . .	—	—	—	1 dr.
Tonsils . . .	$\frac{1}{2}$ in.	$\frac{1}{3}$ in.	$\frac{1}{3}$ in.	1 dr.
Liver	10–12 in.	6–7 in.	$3\frac{1}{2}$ in.	50–60 ozs.
Pancreas . . .	6–8 in.	$1\frac{1}{2}$ in.	$\frac{1}{2}$–1 in.	2–3 ozs.

3. The Vascular System.

		Length.	Breadth.	Thickness.	Weight.
Blood glands	Spleen . .	5 in.	3–4 in.	1–$1\frac{1}{2}$ in.	5–7 ozs.
	Suprarenal capsules	$1\frac{1}{2}$ in.	$1\frac{1}{4}$ in.	$\frac{1}{6}$ in.	2 drs.
	Thymus gland .	2 in.	$1\frac{1}{4}$ in.	$\frac{3}{4}$ in.	1–2 ozs.
	Thyroid gland .	2 in.	$1\frac{1}{4}$ in.	$\frac{3}{4}$ in.	1–2 ozs.
Heart		5 in.	$3\frac{1}{2}$ in.	$2\frac{1}{2}$ in.	11 ozs. M.,[1] 9 F.[1]

Circumference of orifices of heart.	Auriculo-ventricular	Right . .	4–6 in. M., 4 F.
		Left . .	3–10 in. M., 3–7 F.
	Arterial . . .	Right . .	3–4 in. M., 3–3 F.
		Left . .	3 in. M., 2–10 F.

4. Respiratory System.

		Length.	Breadth.	Weight.
Trachea		$4\frac{1}{2}$ in.	$\frac{3}{4}$–1 in.	—
Bronchus	Right . .	1 in.	$\frac{1}{2}$ in.	—
	Left . .	2 in.	$\frac{3}{8}$ in.	—
Vocal cords . . .		7 lines M. 5 F.	—	—
Lungs	Right . .	—	—	24 ozs. M., 17 F.
	Left . .	—	—	21 ozs. M., 15 F.

5. Urinary and Reproductive Systems.

	Length.	Breadth.	Thickness.	Weight.
Kidney	4 in.	$2\frac{1}{2}$ in.	$1\frac{1}{4}$ in.	$4\frac{1}{2}$ ozs.
Bladder (*moderately distended*) .	5 in.	3 in.	—	—
Prostate gland . . .	$1\frac{1}{2}$ in.	$1\frac{1}{4}$ in.	1 in.	6 drs.
Testes	$1\frac{1}{2}$ in.	$1\frac{1}{4}$ in.	1 in.	6 drs.
Uterus	3 in.	2 in.	1 in.	7–12 drs.
Ovary	$1\frac{1}{2}$ in.	$\frac{3}{4}$ in.	$\frac{1}{2}$ in.	1–2 drs.
Vagina	4–6 in.	—	—	—
Penis	7 in.	—	—	—

[1] M. male; F. female.

II.—Size of different Histological Elements (Glands, Cells, Tubes, and Fibres) in fractions of an inch. (They are arranged alphabetically.)

1. *Glands.*

Gastric	$\frac{1}{60}$–$\frac{1}{20}$	in. long.	$\frac{1}{400}$ in. diameter
Lieberkühn	$\frac{1}{360}$–$\frac{1}{60}$	"	$\frac{1}{600}$ in. diameter.
Malpighian body, in spleen	$\frac{1}{70}$	"	—
Malpighian body, in kidney	$\frac{1}{120}$	"	—
Peyer's patches	$\frac{1}{2}$–4	"	$\frac{1}{2}$ in. broad.

2. *Cells.*

	Breadth.	Thickness.
Air cells	$\frac{1}{150}$–$\frac{1}{70}$ in.	—
Blood corpuscles, colored, of man	$\frac{1}{3200}$ in.	$\frac{1}{12400}$ in.
" " fœtus	$\frac{1}{2800}$ in.	—
" " elephant	$\frac{1}{2750}$ in.	—
" " musk deer	$\frac{1}{6300}$ in.	—
" " camel	$\frac{1}{3250}$–$\frac{1}{500}$ in.	—
" " pigeon	$\frac{1}{2314}$–$\frac{1}{3400}$ in.	—
" " frog	$\frac{1}{1230}$–$\frac{1}{2286}$ in.	—
" " proteus	$\frac{1}{400}$–$\frac{1}{720}$ in.	—
" " pike	$\frac{1}{2000}$–$\frac{1}{3500}$ in.	—
" " shark	$\frac{1}{1143}$–$\frac{1}{1684}$ in.	—
" " earthworm	$\frac{1}{110}$–$\frac{1}{1200}$ in.	—
" " leech	$\frac{1}{3000}$ in.	—
Blood corpuscles, colorless, of man	$\frac{1}{2400}$–$\frac{1}{1000}$ in.	—
Cartilage cells	$\frac{1}{900}$–$\frac{1}{1400}$ in.	—
Cilia	$\frac{1}{4000}$–$\frac{1}{2500}$ in.	—
Chyle corpuscles	$\frac{1}{2500}$ in.	—
" molecules	$\frac{1}{30000}$ in.	—
Epithelial cells	$\frac{1}{1500}$–$\frac{1}{3500}$ in.	—
" " nuclei of	$\frac{1}{4000}$–$\frac{1}{6000}$ in.	—
Fat cells	$\frac{1}{300}$–$\frac{1}{600}$ in.	—
Lacuna of bone	$\frac{1}{1200}$ in. long.	$\frac{1}{2500}$ broad.
Pus cells	$\frac{1}{2000}$ in. broad.	—
Ovum	$\frac{1}{100}$ in. "	—
" germinal vesicle of	$\frac{1}{720}$ in. "	—
" germinal spot of	$\frac{1}{3000}$ in. "	—
Spermatozoa	$\frac{1}{500}$ in. long.	—
" body of	$\frac{1}{10000}$ in. diameter.	—

3. *Tubes.*

Bloodvessels, Fine	$\frac{1}{1200}-\frac{1}{100}$	in. diameter.
Bloodvessels, Medium	$\frac{1}{60}-\frac{1}{100}$	"
Capillaries	$\frac{1}{1500}-\frac{1}{3000}$	"
Canals, Haversian	$\frac{1}{1000}-\frac{1}{200}$	"
Canaliculus in bone	$\frac{1}{7000}$	"
Dentine	$\frac{1}{5000}-\frac{1}{10000}$	"
Urinary tubules	$\frac{1}{240}-\frac{1}{600}$	"

4. *Fibres.*

Enamel	$\frac{1}{5000}$	in. diameter.
Muscle, striated	$\frac{1}{400}$	"
" striæ of	$\frac{1}{17000}$	"
Nerve fibres, white	$\frac{1}{12000}-\frac{1}{5000}$	"
" gray	$\frac{1}{6000}-\frac{1}{3000}$	"
White fibrous tissue	$\frac{1}{25000}$	"
Yellow elastic	$\frac{1}{24000}-\frac{1}{4000}$	"

III.—Measures of Length of Various Ducts and Canals in the Human Body.

	in.		in.
Bile duct	3	Testicles (*vas deferens*)	20
Cowper's gland, duct of	$1\frac{1}{4}$	Eustachian tube	$1\frac{3}{4}$
Ejaculatory duct	$1\frac{1}{4}$	Meatus auditorius externus	$1\frac{1}{4}$
Hepatic "	2	Urethra, Male	8
Nasal "	$\frac{3}{4}$	Urethra, Female	$1\frac{1}{2}$
Parotid "	$2\frac{1}{2}$	Ureter	16
Submaxillary duct	2		

IV.—Size of the more Important Parts in Connection with Organs of Special Sense.

Cochlea (*Waldeyer*).

Lamina spiralis membranacea; total length in man	30	mm.
Reissnerian membrane, length of, 1st turn	900	micro-mm.[1]
Reissnerian membrane, length of, 2d turn	700	"
Distance between the bases of the pillars of Corti	66–70	"
Height of arches at centre	12	"
Cell bodies of the inner hair cells, length	18	"
Cell bodies of the inner hair cells, breadth	6–9	"
External hair cells; total length with basilar process	6–7	"

[1] A micromillimetre = $\frac{1}{1000}$ of a millimetre.

Number of the foramina nervina		3,000
" internal pillars		4,500
" internal hair cells		3,300
" external hair cells		18,000

CORNEA.

Cornea proper	thickness	1 mm.
External epithelium	"	30 micro-mm.
Descemet's membrane	"	8–10 "

GUSTATORY ORGAN.

Length of gustatory bulb	80 micro-mm.
Breadth " "	40 "
Width of gustatory pore	3 "

RETINA (*Schultze*).

Rods { length	60 micro-mm.
Rods { thickness	2 "
Cones in fovea centralis; thickness at base	3 "
" elsewhere	6 "
Distance between cones	8–10 "
Distance between striæ on rods	3 "

TOUCH.

End bulbs	= 42 micro-mm.
Pacinian bodies	= 130 "
Touch "	= 85 "

V.—Specific Gravity of Various Constituents of the Body—Water = 1000.

Lungs	342	Serum	1026
Fat	924	Milk	1030
Sweat	1004	Gray matter of brain	1034
Saliva	1006	White " "	1040
Cerebro-spinal fluid	1006	Cartilage	1050
Liquor amnii	1008	Kidney	1052
Intestinal juice	1011	Blood	1056
Pancreatic juice	1012	Liver	1056
Muscle	1020	Fœtal lungs	1056
Urine	1020	Spleen	1060
Bile	1020	Body (entire)	1065
Lymph	1020	Blood corpuscles	1088
Gastric juice	1023	Bone	1900
Chyle	1024		

THÊRAPEUTIC AND PRACTICAL HINTS.

THE HIPPOCRATIC OATH.

The following oath from the works of Hippocrates is so frequently referred to that the medical man of the present day should be made more familiar with its phraseology. As has been truly remarked, it exhibits the practitioners of medicine in a very remote age already formed into a regular corporation, bound by an oath to observe certain regulations, and having regular instructions in the art. The piece here quoted would seem to be an indenture between a physician and his pupil; and it is most honorable to the profession that so ancient a document pertaining to it, instead of displaying a narrow-minded and exclusive selfishness, inculcates a generous line of conduct, and enjoins an observance of the rules of propriety and of the laws of domestic morality.[1]

THE OATH.

I swear by Apollo the physician, and Æsculapius, and Health, and All-heal, and all the gods and goddesses, that, according to my ability and judgment, I will keep this Oath and this stipulation—to reckon him who taught me this Art equally dear to me as my parents, to share my substance with him, and relieve his necessities if required; to look upon his offspring in the same footing as my own brothers, and to teach them this Art, if they shall wish to learn it. without fee or stipulation; and that by precept, lecture, and every other mode of instruction, I will impart a knowledge of the Art to my own sons, and those of my

[1] Genuine Works of Hippocrates, Sydenham Society's edition, by Francis Adams, LL.D., ii. 775, London, 1849. The Oath was translated into English under the title of "The Protestation, which Hippocrates caused his scholars to make," by Peter Low, London, 1597.

teachers, and to diseiples bound by a stipulation and oath according to the law of medieine, but to none others. I will follow that system of regimen which, according to my ability and judgment, I consider for the benefit of my patients, and abstain from whatever is deleterious and mischievous. I will give no deadly medicine to any one if asked, nor suggest any sueh counsel; and in like manner I will not give to a woman a pessary to produce abortion. With purity and with holiness I will pass my life and practiee my Art. I will not cut persons laboring under the stone, but will leave this to be done by men who are practitioners of this work.[1] Into whatever houses I enter, I will go into them for the benefit of the siek, and will abstain from every voluntary act of mischief and corruption; and further, from the seduction of females or males, of freemen and slaves. Whatever, in eonneetion with my professional praetice, or not in eonneetion with it, I see or hear in the life of men, which ought not to be spoken of abroad, I will not divulge, as reckoning that all sueh should be kept secret. While I eontinue to keep this Oath unviolated, may it be granted to me to enjoy life and the praetice of the Art, respected by all men, in all times! But should I trespass and violate this Oath, may the reverse be my lot!

[1] "The circumstance that the novitiate in the art is interdicted from the practice of lithotomy shows that this operation in antiquity was always practised by a class of operators separated from the general profession, and that the regular members of the latter never meddled with it on any account. Hence, in the whole compass of ancient medical literature, there is not a single description of the operation by a person who himself had actually performed it. Avenzoar pronounced it to be an operation which no respectable physician would witness, and far less perform." (Adams, *loc. cit.*)

RULES FOR THE PRACTITIONER.

As an aid to the practitioner, in the daily routine of his profession, the following rules, framed by one of its most distinguished ornaments,[1] will be, if carefully followed, of inestimable value to him, and enure to the comfort and physical improvement of those under his professional care.

1. When a disease is progressing favorably towards recovery, it is unwise to interfere with the spontaneous effort at cure by the administration of drugs. The end and aim of treatment is not only to restore health, but to do so safely and speedily and pleasantly.

2. Where drugs are needed, and there is a choice of remedies, employ that one which will be the least distressing at the time, and subsequently the least injurious to the constitution.

3. Put the medicine into that form in which it can be most easily taken. When possible, especially with children, cover the disagreeable taste of the draught by syrups, etc.

4. If there be an idiosyncrasy with respect to any special medicine, such as mercury, arsenic, iodide of potassium, opium, nux vomica, assafœtida, turpentine, etc., avoid administering it. That a peculiarity of constitution, causing an extreme susceptibility to the influence of certain drugs and foods and odors, sometimes exists, cannot be disputed. It is as certain that it can seldom be safely combated.

[1] Tanner, Practice of Medicine, 5th Amer. ed., p. 1047, Phila. 1872.

5. Attend to the condition under which the patient will be at the period of the medicine's action; for example, it will be worse than useless to give a sudorific to an individual obliged to be in the open air soon after taking it.

6. Be careful that the various agents in the prescription are not incompatible with each other, unless it be desired to form some new or particular compound. Chemical incompatibility, however, is by no means synonymous with therapeutic inertness; for experience tells us that certain unchemical compounds—perchloride of mercury and tincture of bark, gallic acid and tincture of opium, calomel and compound ipecacuanha powder, etc., are all valuable preparations in curing diseases.

7. Remember that if a disease be incurable, it may still admit of great alleviation. Hence, it is cruel to give up any case; although, at the same time, the patient is not to be deceived by false promises.

8. Never order, or sanction the use of, a quack medicine; that is, one the composition of which is kept a secret.

9. Bearing in mind the weakness of human nature, as well as the prejudices and superstitions which are current, it is not only necessary to give good advice, but pains must be taken so to impress the patient and attendants that the necessary treatment may be thoroughly carried out. *Hope* and *confidence* are no mean remedial agents, and in many chronic diseases at least, the individual who has *faith* will recover more speedily, *cæteris paribus*, than he who is shy of belief.

10. Simply to prescribe drugs, without regulating the diet and general management of the patient, is to omit a most important duty. In acute diseases plain directions

must be given as to the ventilation and warmth of the sick-room, the amount of light, the position of the bed (not to be placed in a corner), the degree of quiet to be maintained, the avoidance of excitement and whispering, the exclusion of visitors, the cleanliness of the sufferer, and the nature and quantity and times for administration of food. No cooking whatever should be permitted in the sick-room. In cases of long illness, when the patient can be moved without risk, it is often desirable to have two beds in the room, one to be occupied during the day, the other at night. Every precaution must be taken to prevent the spread of infectious disorders. Soiled linen, dirty water, etc., must be immediately removed. In all instances the evacuations ought to be passed in a bed-pan or night-stool containing some disinfectant material (carbolic acid, permanganate of potash, sulphate of iron, etc.).

11. While it is allowed that formulæ may often be employed with great advantage, yet they should not be prescribed with servile exactness; for it should never be forgotten that all medicines of any power have to be adapted to the requirements of the special case under treatment. It has been quaintly but truly observed, that a bundle of ready-made receipts in the hands of the routine practitioner is but a well-equipped quiver on the back of an unskilful archer.

12. In watching the restoration of a sick man to health, it is a mistake to attribute the improvement too confidently to the action of the medicine prescribed, for it may not have been taken, or it may not have been absorbed, or its properties may have been destroyed by adulteration, or it may have even proved injurious—recovery occurring in spite of it.

RULES OF MEDICAL ETIQUETTE.[1]

The aim of the few following rules of Medical Etiquette is to place before the profession a definite law for the guidance of those who wish to act on friendly terms with their professional brethren, and thereby to prevent those constant unpleasant feelings which are caused by a want of knowledge of professional etiquette.

It is not thought necessary to dwell upon more than the most common difficulties which beset us in our daily work. It is a difficult task to make any law, for whatever purpose, to please every one. At the present time there is no work upon the subject, and the only light that has been thrown upon etiquette laws has been through the medical press and through codes of ethics, as of the American Medical Association.

Medical Etiquette, if carried out strictly, as it should be, is one of the greatest ties which medical men have to bind them together and make them work happily; and it is frequently from a misunderstanding as to what constitutes etiquette that we so often find one man falling out with another. If we had distinct rules to lead us we should, perhaps, hear less than we do of so much ill-feeling existing, and our medical press would not be troubled with so many letters upon Medical Etiquette, professional differences, etc. etc.

[1] These rules have been condensed and somewhat modified from those recently published by a licentiate of the Royal College of Physicians; but they are generally applicable in our own country, and the every-day experience of the practitioner. On some points American practice may differ somewhat from the line of conduct here laid down. In other matters not alluded to by him, the reader is referred to the Code of Ethics of the American Medical Association.

We, like other men, have to live, and this is one point which should always be borne in mind. If we act as becomes gentlemen, taking care that we do that which is right, honest, and straightforward, we should never allow such trifles as a patient changing hands, or a young man commencing practice in our midst, to influence the friendly feeling which should exist in such a limited body. If we take any small town and look around us, we see amicable relations maintained between almost all classes; but how seldom do we find, say, two or three medical men living in the same town all friendly—able and willing to assist each other, to shake hands together, and to meet at each other's houses on terms of intimacy? Not often does this happen; and why? If we ask ourselves the question, we shall find in a majority of cases it is from some breach of Medical Etiquette; and if it be asked what are the rules of Medical Etiquette, there are few who can tell you what they are.

Even as regards a new-comer into a town, you will find it is hardly known whose place it is to make the first call, and this alone may be the means of long-continued isolation.

I. The question of *a medical man commencing practice in a small town*, without succeeding to one already in existence, deserves our first attention, as a new-comer is too often looked upon as an enemy come into the camp, to seize upon anything he can.

It, therefore, behooves such a one to be as careful as possible to do everything in his power to bring about a friendly feeling. As soon, then, as he begins to practise, his first calls should be upon the other medical men in the place, choosing the most convenient time he can to catch the doctors at liberty. Should they not be in—one

or all of them—it will be best to leave his card, and not attempt, time after time, to see any that happen to be out, or engaged.

The reason for giving this advice is twofold. Firstly: They may, perhaps, not wish to see him at all, taking offence at his being an opponent; and the very fact of his forcing himself into their presence may make them treat him with scant courtesy. Secondly: If he leave his card, it will rest with them to show him, by calling at his residence, if they wish to become friendly.

When a partner is taken into a practice, this introductory call is frequently dispensed with; but this is a great mistake, and the reason for not calling is easily discovered. The senior partner says to his commencing junior: "I should have nothing to do with So-and-so, but this one and that one are very nice fellows." The consequence of this is he calls on none—those whom his partner objects to are not visited for the reasons stated, and the others are introduced from time to time as opportunity offers.

Of course, there are reasons the senior partner might give which would make it impossible for the junior to make a friendly call upon some, but upon those the senior knows and can meet in consultation, it is far better for the junior to pay the usual introductory call, and know his fellow-workers at once.

Unless there be any good reasons existing—which are known to be facts—let a new-comer therefore call upon all the medical men during his first week in practice, and he will then ascertain by the return calls, to a certain extent, those he may look on as friends.

II. Cases occur *where a medical man is in attendance, and the patient's friends wish to obtain a second opinion*

without the first medical man knowing that they have called in the second.

This probably gives rise to more annoyance and disagreements between doctors than any other cause, the reason being that the second medical man acts without knowing that the first is in attendance. An instance to make the meaning clear. A. is taken ill and sends for B., the regular medical attendant, who attends for a time; but A. getting no better, the friends wish this or that doctor to see the case and get his opinion; so it is arranged that Dr. C. shall be called in, to hear what he has to say.

Dr. C. is, perhaps, away from home when some of A.'s friends call upon him and leave a message as follows: "Please ask Dr. C. to call as soon as he can to see A., as he is very ill." C. attends as wished, and, after a short conversation with the patient, he may, perhaps, discover that he is under B.'s care, or he may not find it out until after he has fully examined the case and given his opinion thereon.

He instructs the patient's friends to send for the medicine, when he is told—"Oh, doctor, we only wished to get your opinion; Dr. B. is attending the case, but we wished to have a little more advice." This will most likely be the case if both are of the same opinion; but should C. say the case will get well, and B. say it will prove fatal, or most likely so, the result is C. will be asked to continue attending.

In the first place, how are we to prevent this happening? and in the second place, when it has happened, what is the proper mode of procedure?

As regards the first question—How are we to prevent the above? This can generally be done, unless the patient and his friends tell a direct lie. The course I follow

is this: A new patient sends for me, and if I see the messenger, I nearly always ask the following: "Do you know what is the matter? How long has he been ill? Has any one seen him?"

Now if, to the first question, we get such an answer as "He is suffering from inflammation of the lungs," or "He has pleurisy," we may come to the conclusion he has been seen by some one. Then, again, in regard to the second question—"How long has he been ill?" We will have the reply, "A week," "A long time," or something of that kind; if so, we may infer that some means have been used by some one, and we then put the question, "Has any one seen him?"

By the two previous questions we have so far driven the messenger into a corner, that we will most likely get to the truth, although he may wish to say nothing. Having got so far, and discovered that a medical man is in attendance, how should we act? This is easily told. There are two courses open to the friends. The proper way is to point out that we cannot interfere, but will be most happy to meet Mr. So-and-so in consultation, and that we decline to see the case without. Very frequently the parties will say, "But we wish you to take care of the case, as we are not satisfied and would rather have you." Under these circumstances we should point out to the parties interested that we cannot undertake the case until they have sent word to the other medical man that he is not required any more, and then we are at liberty to take charge of the case.

It must be borne in mind that every person has as much right to change his medical man as he has to change his solicitor or tailor, and every medical man has a right to take charge of a patient when his previous professional attendant has been discharged. Misapprehen-

sion on this point is one great cause of unfriendly feeling, but it must be borne in mind that what may happen to us to-day will happen the opposite way at some future time; and the full weight of the annoyance and loss should be shown, if at all, towards the patient and his friends, and not towards the new medical attendant.

The way to act, then, in the first place, if we have discovered, before seeing the patient, that he is already under treatment, is to offer to meet the medical man in consultation; and if this is not agreed to, but we are wished to attend the case altogether, to request the friends to communicate with the doctor in charge, and inform him that he is no longer required.

In the second place, when we have seen the case, and given our opinion upon it, and have been then asked what our fee is and told we need not call any more, because So-and-so is the regular doctor, I would say, take no fee, but inform the practitioner of the manner in which we were dragged in, and explain to him that it was done in ignorance, allowing him to charge our visit.

By taking no fee we prove to him that we have not seen the patient knowing him to be in attendance.

It sometimes happens in a case like the above, that the friends wish to call in a younger man as the consulting physician, and the older practitioner objects to and refuses to meet the junior, on the simple grounds that, if a second opinion be desired, a man who has had more experience than himself should be called in. Under these circumstances the friends will sometimes try and persuade a medical man to call quietly and say nothing about it, or will say that if the doctor who has the case in hand decline to meet a younger man, they will call in any one he may like to name; but in a majority of cases, if they have a desire for a special doctor, they prefer to give up

their old one and call in the new. In this case, the junior practitioner has a perfect right to take full charge of the patient, if word be first sent to the other doctor that his attendance is no longer required.

It also sometimes happens, that, owing to some previous disagreement, two medical men are not on speaking terms, and therefore one will not meet the other in consultation. In this case it is best to point out this fact, when, if it has been fully resolved to have a second doctor called in, there is no reason why he should not take charge of the case, if the previous notice to the other practitioner have been given.

Medical men are too much inclined to look upon their patients as private property, and to consider it a grievance if another practitioner should have them in his list. It should be remembered, however, that it is not the doctor who is to blame, but the patient.

III. *Can a medical man honestly meet a homœopath in consultation?*

To this I can only say, certainly not. And why? In the first place, as regards homœopathy: I know very well that some qualified men take up that practice, and I have no reason to doubt that they practise it honestly and believe in their mode of treatment; at least, I think we should give them credit for honesty of purpose. I know many men who would not think of giving ʒss or ʒj doses of potassii iodidum, some considering 10 gr. to 15 gr. a very extreme dose, and therefore they stand between the two classes; but the point is, that if a man professes to be a homœopath, it is impossible for him to fall in with any treatment advised by an allopath.

What is the use of two men meeting in consultation, when one looks upon the other as useless, or worse? I

have no doubt that the true homœopath considers that the allopath is killing his patients by the large doses of medicine he daily administers, and I can answer for the other side, that I consider the doses ordered by the homœopath are too small to be of use, and condemn the treatment as being so much waste of time, and therefore injurious in the way of do-nothing treatment. How can two such men meet honestly in consultation and order a definite plan of treatment to be carried out? They cannot, and therefore the one or the other must pocket his fee, and be content to let the patient go on as before.

IV. I now venture to suggest a rule as to *how one medical man should act towards another when he attends for him.*

In many cases a patient says, "Doctor, if you are away from home I should like So-and-so to attend me," and he does attend. Now, as regards the fee to be charged. Midwifery, of all things, I believe, is subject to more differences as to charge for attendance than any other class of cases; and it may happen that a medical man attends for another who charges less than he does, and when the case is over, the friends will frequently say, "Well, doctor, what is your fee?" Now, the proper plan is to say, "You must settle with Dr. So-and-so when he comes home," as by this means you do not charge more and you do not accept less than your general fee. How should you act, also, with respect to the division of the fee? I believe a good rule is to offer half to the doctor who attended, but in some towns it is usual for medical men to attend for each other for nothing, and in others to take the fee.

As regards taking the offered fee, this depends upon circumstances, and I for one should decline it, unless pressed, if I attended for a friend; but it might happen

that I attended for a man with whom I was not on such friendly terms, and I then could please myself as to the course to be pursued. If it was for myself that some one else had attended, he could not say anything about being badly treated if this rule was adopted.

V. *When a medical man is called in consultation by another medical man in a case of operative midwifery, what is the proper line of action?*

I have known two courses followed, but I consider the one is right, and the other wrong.

Let me first give the two modes, and then sum up my reasons for judging which is right.

A man gets a case of convulsions; a consultation is held, and delivery is deemed advisable; or it may be considered, after consulting together, that the proper course is to bleed. Now, whose place is it to do the required work? Is it the place of the regular practitioner in charge to bleed, turn, or deliver with instruments, or is it the consulting physician's place? I say most decidedly it is the place of the general practitioner to do so, the consulting physician having first advised, and the medical man having agreed upon the point. I have known both courses followed; that is, I have known the consulting physician to say that so-and-so is the proper thing to do, and to set to work and do it; and I have known the consulting physician to assist, and allow the medical man to follow out the treatment.

Why should the consultant allow the general practitioner to undertake the treatment? Simply on these grounds—that he is most likely only called in to assist and to strengthen the hands of the one already in attendance, and if he obtain his fee he has no right to step in between the doctor and patient and thus make it appear

to those around that he is better able to undertake the treatment.

What I consider the proper behavior is for a medical man to give a ready and willing hand to a brother practitioner, and in no way to make himself appear the better man of the two. It will frequently happen, and generally is the case, that the medical man in charge offers the consultant the option to carry out the treatment. It is best for the consultant to volunteer to assist, and then, if asked to undertake the treatment, to do so at once.

VI. *What is the proper manner to act when one medical man has been sent for to attend for a doctor who may be elsewhere engaged?*

As soon as ever the family doctor finds that another practitioner is attending for him, he should at the earliest opportunity free him. The labor may not be over for some considerable time, and it is undoubtedly unfair to expect any one to sit perhaps the best part of the day over a case for another man. When he arrives he should inquire of the doctor in charge how the case is getting on, say he is sorry to have troubled him, and that as it will not be over for a short time, he will not detain him from his own work. Of course if the case be over before the arrival of the general practitioner, intimation should be sent to him by the patient's friends, with a message that he need not call that day unless he wish.

VII. *Cases sometimes occur, where several medical men are sent for at the same time*, the patient being a stranger, and not having had a medical man before.

I believe Etiquette demands in such a case that the medical man who arrives first should take charge of the

case, unless it be the patient's wish to have this or that medical man instead.

As regards a fee for this first attendance, I think it is best not to take one, but allow the work done to go with the work to be done, and be charged by the patient's own medical attendant whom he has chosen to look after him.

VIII. *In cases of accident, sudden illness, or fit,* the nearest medical gentleman is sent for in the hurry, nothing being said about any one else being the regular attendant.

Under these circumstances, I always inquire, if I have merely been sent for in the emergency, and if so, request that the usual medical man had better be informed.

Now and then a doctor will be told, "Oh no, we sent for you, and you had better call and attend to the case." Under these circumstances, he has a right to continue the attendance, and charge accordingly.

Some medical men hold that, if a case of this kind happen, no matter how much the friends and patient wish the doctor who has been sent for to continue in attendance, it is his place to refuse, and say, "No, send for your own medical man." This, I maintain, is wrong; and, no matter who the man may be, if they have only sent for him, and they wish him to continue, there is nothing unprofessional in his doing so.

I have known a case where a medical man, hearing that an old patient of his had met with an accident, and knowing that another medical man had seen the case, called upon the patient, and made inquiries, and left word that he would call again. This is very objectionable, and, I hold, unprofessional, as it is possible it was intended to change the doctor, preferring the one they had sent for.

I would make the following rule as regards these cases: That whatever medical man is sent for, if he be the only

one called in, the case is his, if the friends and the patient wish him to continue in attendance after the offer to retire in favor of their own medical man has been made.

IX. *It sometimes happens that two medical men do not agree as to the treatment to be adopted after consultation:* in such a case, what is the proper course to pursue?

They have examined the case together, have talked the matter over, and their opinions differ: one says "I would recommend this," another says "I would recommend that;" therefore, whichever course is followed, it does not meet the wishes of both. How should they act in such a case? The proper plan is to point out to the patient and the friends that they do not quite agree, but that as one wishes this treatment to be tried, the other has no objection to adopt it, and to watch the result. If the case should be one for operation, and opinions differ, it may be well to suggest to them that a third opinion be obtained, and the result of the combined opinion should be acted upon.

In the case of cancer of breast, for example, there is a great difference of opinion as to the good of removal; and it is very easy to point out to the friends that a difference of opinion exists amongst medical men, leaving it for them to decide upon the course they would wish followed.

It is far better to act openly in matters of this kind at the time, and not to say afterwards: "Well, it is not what I should have advised; but, as you called in Mr. So-and-so, I thought it was best to follow out his treatment."

X. *If a patient call at a doctor's house, for his advice, has he any right to question him if he has been under any other*

medical man, or is it his place to attend to him? If he find he has been under some one else, and has merely come to him for his opinion, how should he act?

In the first case, all patients who come to your own house for consultation are your patients—they have decided to place themselves under your care—and it is your right to attend to them without asking why they have come. A patient has a perfect right to come to you in the morning and go to another medical man in the afternoon; for as soon as a patient leaves the consultation-room, he is no longer a patient of yours until he again returns. If this rule did not hold good, you would have constantly to refuse those who come.

For instance, a man is suffering from heart disease or consumption, and does not improve under your treatment; he is told the nature of his complaint, but does not believe; so he says: "I will not go there any more, but will try some one else." He calls upon another medical man, and asks him what is the matter, and will he prescribe for him? Surely it would not be right to refuse to do so, and tell him to go back to his own doctor. Let this be perfectly understood in the profession—that whoever calls upon a doctor at his own house is his patient as long as he continues to call.

In the second case—where a person merely comes to you for your opinion—it is somewhat different, as you may be the means of shaking the confidence of that patient in his late medical attendant.

How, then, should you act? If you find the attendant is a man whom you could not meet, it is, perhaps, the best way to decline to interfere; but if you do not know the professional attendant, you may act in two ways, both of which I believe to be correct. The one is to examine

the case, and write a letter for the patient to deliver, and the other is to offer to meet in consultation.

By sending a letter you let the medical man know that the patient has been to you, and you can give him your opinion, leaving it for him to follow or not as he thinks well. If you offer to meet in consultation, and the patient objects, then I would say that you could not very well give him your opinion; but you could still do as above—examine the patient, and give him a letter to deliver. The reason why a patient may object to a consultation is the expense, because the medical men may reside some distance apart.

XI. *In some cases you will have a person sent to you by a fellow-practitioner for your opinion*, and then the course to follow is plain. You should examine the patient and write out your opinion, the reasons for coming to such a conclusion, and the treatment you would advise, and give it to the patient to deliver. He will be sure to ask you this and that question, to get your opinion as to what is the matter, etc., but be guarded in your replies, and never give a direct answer, but tell him that the doctor will explain everything to him when he gets your letter.

In conclusion, I would wish to say that the medical profession stands almost alone in the manner in which its members should act towards each other. Illness is not like other things. Food, drink, clothing, can all be put to one side for a time, and can be obtained here and there as people wish; but with sickness, which comes on without a moment's warning, advice is required without delay, and if it cannot be obtained at one place at once it must be had somewhere else, and oftentimes our nearest and

dearest friend has to seek advice from a stranger. It is this that obliges one so often to do the work of another, and it therefore warns us to do it freely and willingly, remembering that there is no telling how soon we may require the same.

As a rule, the man who has the largest practice is the one who has more trouble with his professional brethren than others, because he is constantly being dragged into difficulties by his patients—the clergyman of the village, or the squire, would like his opinion upon this or that one, and the doctor, in many cases not liking to offend, is apt to do more than he should. If we had more definite rules as to what was right and what was not right, I believe we should work more in harmony than we do at the present time; but strive as we may to keep friendly with all, we cannot, and I would therefore say to my readers: Do that which is right, act honestly, and do nothing that you would not like another to do to you.

No matter how we strive to follow out the above, if we have our share of practice we shall meet with many things distasteful to us, which will make us angry with each other; but if we consider our own faults, and remember that none are spotless, we shall be more inclined to look upon some of the deeds of others as not having been done with a malicious intention, but merely caused by circumstances, which, if properly explained, would still more firmly bind us together, and make us what we should be—more friendly one towards another.

WHAT THE PRACTITIONER MUST LEARN OF THE PATIENT.

It is often a matter of convenience, in taking notes of a case, to base them on some general system of inquiry. The young practitioner, especially, should adopt some method of this kind at an early period of his career. In his history of a case from its inception to its close, whether the result be favorable or unfavorable, such an outline sketch, well filled up, will prove valuable for present uses and future reference. As has been truthfully remarked by Dr. Henry W. Acland, by whom the following table was prepared,[1] a skilful practitioner can learn the truth of any case in any order or in no order; but it may be added that such a table will prove useful even to the most systematic :—

HISTORY.

When were you last quite well? at work? How did you first feel ill? Supposed cause, mode of onset, any medical treatment?

What do you now chiefly complain of? What illnesses have you had before this? (If the examination suggest it, obtain further information concerning residence, occupation, past life, change of habits, history of the family, hereditary prediposition, etc.)

PRESENT STATE.

I. General Aspect.—Manner, posture (in bed, out of bed), color, shape, temperature, weight (alteration in), eruption, œdema.

Notice *generally* head, neck, chest, abdomen, limbs.

[1] Handbook for Hospital Sisters, by Florence S. Lees, London, 1874.

II. ORGANS OF DIGESTION.—Hunger, thirst, taste. *Lips*, color, texture. *Teeth*, loose, etc. *Gums*, color, size, texture, position. *Tongue*, protrusion, volume, form, color, surface, dryness, coating. *Stomach*, nausea, vomiting, eructations, pyrosis, pain during, before, after (how soon after?) eating.

III. ORGANS OF ABSORPTION.—*Lymphatics*, red, tender, hard. *Glands*, tender, swollen (for what length of time).

[The patient must be in bed or undressed for a complete inquiry into Nos. IV., V. and VI.]

IV. EXAMINATION OF ABDOMEN.—By palpation, percussions, measurement. Dimension of liver, spleen. Existence of pain, increased or diminished by pressure; general or circumscribed; under the hand or at another point. Existence of tumors, fluids, flatus, feces; of hernia; of tumors in groin; of hemorrhoids; of feces in rectum.

V. ORGANS OF CIRCULATION.—*Heart*, position, dimensions, force, rhythm, sound (character, situation, and distance). *Arteries*, pulse at wrist; rate, volume, hardness, laboring, regularity, intermission, dicrotism, etc.; tumors. *Veins*, enlargement, tenderness, murmurs.

VI. ORGANS OF RESPIRATION.—*Respiration generally;* frequency, regularity, difficulty, odor of breath. *Nares*, discharges, odor, action. *Epiglottis; Larynx*, tenderness, alteration of voice. *Cough*, its character and supposed cause. *Expectoration*, color, odor, tenacity; chemical, microscopical properties.

Examination of Thorax.—Form flattened, rounded, asymmetrical; supra and infra-clavicular spaces, etc. *Movements; vocal fremitus; intercostal spaces.*

Resonance on percussion; changed by posture. *Sounds* on inspiration, expiration, speaking, coughing, succussion.

VII. ORGANS OF SECRETION AND EXCRETION.—*Skin*, eruption; sweat, quantity, chemical quality; locality. *Kidneys*—Pain in micturition; its seat and direction; pain in the loins. *Urine*, frequency (night or day), quantity, appearance. Microscopic deposits, *organic*, *inorganic*. Chemical examination—acidity, specific gravity, albumen, sugar, bile, excess of urea, etc.

Bladder, tumors, irritability, etc., calculus.

Bowels, frequency of action, character of evacuations.

VIII. ORGANS OF GENERATION.—(Male), penis, scrotum, testes, cord.

(Female), *catamenia*—color, quantity, frequency, duration.

Leucorrhœa, or other discharges.

Pain—its seat, duration, causes, periodicity.

Uterine, pelvic, ovarian enlargements, tenderness, ulcerations.

External sores—eczema, pruritis.

IX. NERVOUS SYSTEM.—*Brain*, general intelligence, memory, speech, slowness of manner, headache (where), giddiness, sleep, dreams, fits (one kind or more).

Spinal Cord and Nerves.—Pain, alterations in kind or degree of sensibility, in sight (pupils), hearing, smell, taste, touch, numbness; tremors, rigidity, rigors, paralysis.

X. ORGANS OF MOTION.—Pain, stiffness, swellings, nodes, ulcers, abscesses.

DOSES OF MEDICINES.

In addition to the actual quantity of any remedy to be prescribed in individual cases, modifying circumstances must be taken into consideration, such as age, physical condition, etc. It is difficult to limit the effective doses of a medicine within the fixed quantities assigned to it in the various posological tables, such quantities being mentioned as a general guide to the practitioner, beyond which he may sometimes step, according to his own discretion. As will be seen, however, in one of the accompanying tables (seep. 114),an effort has recently been made to define the maximum doses of the more potent agents. The practice of using caution marks for excessive doses knowingly prescribed, has not yet come into vogue in this country, but it has been suggested by the American Pharmaceutical Association, and other authorities, that such methods of protection and safety should be generally adopted.

Wherever desirable, the French metric system is mentioned in conjunction with that in general use, so that the practitioner may become familiarized with its peculiar construction.

Doses for Children.

The simple rule, generally applicable, is as follows:—

Under twelve years of age diminish the dose of the medicine in the proportion of the age to the age increased by twelve.

At one year of age the dose will be $\frac{1}{1 + 12} = \frac{1}{13}$.

At two years, $\frac{2}{2 + 12} = \frac{1}{7}$.

At three years, $\frac{3}{3 + 12} = \frac{1}{5}$.

At six years, $\frac{6}{6 + 12} = \frac{1}{3}$.

Another reliable method of calculating doses for children is the following:[1] The proportionate dose for any age under adult life is represented by the number of the following birthday divided by 24:—

The dose for a child of	1 year is	$\frac{2}{24}$	$=$	$\frac{1}{12}$.
" " "	2 years is	$\frac{3}{24}$	$=$	$\frac{1}{8}$.
" " "	3 "	$\frac{4}{24}$	$=$	$\frac{1}{6}$.
" " "	5 "	$\frac{6}{24}$	$=$	$\frac{1}{4}$.
" " "	11 "	$\frac{12}{24}$	$=$	$\frac{1}{2}$.

In prescribing individual remedies for diseases of children, the practitioner must not, however, be governed blindly by such a table as is here offered. In some instances it will be necessary for him to diminish the amounts, in others to increase them, although in very young children extreme caution will be required if the agent is very potent, as in the case of the opiates, antimony, etc. Some of the comparatively harmless remedies mentioned, such as syrupus rhei aromaticus, oleum ricini, mistura cretæ, etc., may be given in rather larger doses than are here assigned to them, or than the ratio above given would seem to warrant. Children tolerate larger proportional doses, also, of the bromides, of quinia, belladonna, cod-liver oil, chlorate of potash, and other remedies. The doses of opium, antimony, veratrum viride, etc., it will be seen, are decidedly smaller than the ratio there given. Very young children are not as susceptible to the action of mercurials as adults. As a general rule,

[1] Dr. R. O. Cowling, *Amer. Practitioner*, July, 1872.

the quantities here mentioned are such as will bear repetition. After all, the good sense and discretion of the prescriber must in the case of children, even more guardedly than in that of adults, direct him as to the appropriateness of a remedy, and the frequency of its employment.

Several years since the Pharmacopœia of Guy's Hospital contained a schedule of a posological table, which forms a useful guide to attain the same end. The maximum or full adult dose is taken as the point of departure for the doses to be given at all ages. The ratios do not correspond exactly with those just given for children, but approximate them sufficiently for all useful purposes:—

	Maximum dose.		
Age.	One ounce, ℥j	One drachm, ʒj	One scruple, ℈j
1 month . . .	gr. xxx	gr. iij	gr. j
3 months . . .	gr. xxx	gr. iv	gr. j
6 " . . .	gr. xl	gr. vj	gr. ij
9 " . . .	gr. xl	gr. vij	gr. ij
1 year . . .	ʒj	gr. viij	gr. iij
2 years . . .	ʒiss	gr. x	gr. iv
3 " . . .	"	gr. xij	gr. iv
4 " . . .	ʒij	gr. xv	gr. v
5 " . . .	ʒiiss	gr. xviij	gr. vj
6 " . . .	ʒiij	gr. xx	gr. vij
7 " . . .	ʒiiiss	gr. xxv	gr. viij
8 " . . .	℥ss	ʒss	gr. x
10 " . . .	ʒivss	gr. xxxv	gr. xij
12 " . . .	ʒv	gr. xl	gr. xiv
13 " . . .	ʒvss	gr. xl	gr. xv
15 " . . .	ʒvj	gr. xlv	gr. xvj
18 " . . .	ʒviss	gr. xlv	gr. xvij
20 " . . .	ʒvij	gr. l	gr. xviij
21 to 45 " . . .	℥j	ʒj	gr. xx
50 " . . .	ʒvij	gr. l	gr. xviij
60 to 70 " . . .	ʒvj	gr. xlv	gr. xvj
80 to 90 " . . .	ʒv	gr. xl	gr. xiv.
100 " . . .	℥ss	ʒss	gr. x

By way of illustration of the rules here laid down, the following examples, embracing the chief medicines prescribed for young children, may be cited. The average dose for the adult is first mentioned as a guide, deductions being made from it to exhibit in a regular series the influence of age on the dose. As the remedies mentioned are such as are almost daily employed, the list will doubtless be consulted frequently by the practitioner. It will save him the trouble of estimating for himself the quantity to be administered to infants and children, the calculations being carefully made in each instance. It will be observed that the ages mentioned range from infancy to four years. After the latter period, the practitioner can readily fix the dose from the data here given, and from comparison with the tables to be hereafter presented (see p. 103). As a rule, the remedies prescribed for young children are soluble in water or syrup, or readily miscible for administration in a palatable form.

Should the practitioner desire to convert this table into the phraseology of the metric system, he must bear in mind that 1 gramme = 15.434 grains, that 1 fluidrachm = 3.7 grammes, and 1 minim = .06 grammes, or 6 centigrammes.[1]

[1] As already explained (p. 31), this varies with the tenuity, etc., of the fluid.

Doses for Young Children.

Article.	Adult dose.	Under one year.	One year.	Two years.	Four years.
Acetum scillæ . .	fʒj	gtt. iv	gtt. vij	gtt. x	gtt. xvj
Acidum benzoicum .	gr. xx	gr. j	gr. iss	gr. ivss	gr. iv
" carbolicum .	gr. j	gr. $\frac{1}{20}$	gr. $\frac{1}{12}$	gr. $\frac{1}{8}$	gr. $\frac{1}{5}$
" hydrocyanicum dilutum .	gtt. iss	gtt. $\frac{1}{15}$	gtt. $\frac{1}{8}$	gtt. $\frac{1}{6}$	gtt. $\frac{1}{3}$
" nitricum dilutum	gtt. x	gtt. ss	gtt. j	gtt. iss	gtt. iij
" sulphuricum aromaticum .	gtt. x	gtt. ss	gtt. j	gtt. iss	gtt. iij
Æther	fʒi	gtt. vij	gtt. xij	gtt. xx	gtt. xxx
Alumen[1] . . .	gr. xx	gr. j	gr. ij	gr. iij	gr. iv
Aloes					
Ammonii bromidum .	gr. xv	gr. $\frac{3}{4}$	gr. j$\frac{1}{4}$	gr. ij	gr. iij
" carbonas .	gr. xv	gr. $\frac{3}{4}$	gr. j$\frac{1}{4}$	gr. ij	gr. iij
" chloridum .	gr. xv	gr. $\frac{3}{4}$	gr. j$\frac{1}{4}$	gr. ij	gr. iij
Antimonii et potassii tartras[2] (emetic) .	gr. ij	gr. $\frac{1}{10}$	gr. $\frac{1}{4}$	gr. $\frac{1}{4}$	gr. $\frac{1}{3}$
(diaphoretic) .	gr. $\frac{1}{8}$	gr. $\frac{1}{150}$	gr. $\frac{1}{100}$	gr. $\frac{1}{60}$	gr. $\frac{1}{40}$
Antimonium sulphuratum[2] . . .	gr. ij	gr. $\frac{1}{10}$	gr. $\frac{1}{6}$	gr. $\frac{1}{4}$	gr. $\frac{1}{3}$
Aqua camphoræ . .	f℥ss	gtt. xv	gtt. xx	gtt. xxx	fʒj
" cinnamomi .	f℥ss	gtt. xv	gtt. xx	gtt. xxx	fʒj
" menthæ piperitæ	f℥ss	gtt. xv	gtt. xx	gtt. xxx	fʒj
Argenti nitras . .	gr. ss	gr. $\frac{1}{40}$	gr. $\frac{1}{24}$	gr. $\frac{1}{16}$	gr. $\frac{1}{10}$
Arsenici iodidum .	gr. $\frac{1}{10}$	gr. $\frac{1}{150}$	gr. $\frac{1}{100}$	gr. $\frac{1}{60}$	gr. $\frac{1}{40}$
Assafœtida . . .	gr. x	gr. ss.	gr. j	gr. iss	gr. ij
Bismuthi subnitras .	gr. xv	gr. $\frac{3}{4}$	gr. j$\frac{1}{4}$	gr. ij	gr. iij
Carbo ligni . .	ʒj	gr. iij	gr. v	gr. vj	gr. x
Chloral	gr. xv	gr. $\frac{1}{2}$	gr. j	gr. iss	gr. ij
Chloroformum . .	gtt. x	gtt. ss	gtt. j	gr. iss	gr. iij
Cinchonæ pulvis .	gr. xxx	gr. iss	gr. iiss	gtt. ivss	gtt. vj
Creta præparata . .	gr. xx	gr. j	gr. ij	gr. ijss	gr. iv
Cupri sulphas . .	gr. $\frac{1}{2}$	gr. $\frac{1}{40}$	gr. $\frac{1}{24}$	gr. $\frac{1}{16}$	gr. $\frac{1}{12}$
" " (emetic)	gr. iij	gr. $\frac{1}{6}$	gr. $\frac{1}{4}$	gr. $\frac{1}{3}$	gr. $\frac{2}{3}$
Creasotum . . .	gtt. j	gtt. $\frac{1}{20}$	gtt. $\frac{1}{12}$	gtt. $\frac{1}{8}$	gtt. $\frac{1}{5}$
Extractum belladonnæ	gr. $\frac{1}{4}$	gr. $\frac{1}{50}$	gr. $\frac{1}{40}$	gr. $\frac{1}{30}$	gr. [illegible]
" cinchonæ fluidum	gtt. xx	gtt. j	gtt. ij	gtt. iij	gtt. iv
" ergotæ fluidum .	gtt. xx	gr. j	gtt. ij	gtt. iij	gtt. iv
" nucis vomicæ .	gr. ss	gr. $\frac{1}{30}$	gr. $\frac{1}{24}$	gr. $\frac{1}{16}$	gr. $\frac{1}{10}$
" spigeliæ et sennæ fluidum .	f℥ss	gtt. xv	gtt. xx	fʒss	fʒj

[1] As an emetic in croup, alum has been given in teaspoonful doses to children.

[2] Although the doses are here mentioned, antimonial preparations should not be given to the very young.

Doses for Young Children—Continued.

Article.	Adult dose.	Under one year.	One year.	Two years.	Four years.
Ferri et ammonii citras	gr. x	gr. ss	gr. j	gr. iss	gr. ij
" hypophosphis	gr. v	gr. $\frac{1}{4}$	gr. ss	gr. $\frac{3}{4}$	gr. j
" et quiniæ citras	gr. iij	gr. $\frac{1}{2}$	gr. ss	gr. j	gr. iss
Ferrum redactum	gr. v	gr. ss	gr. j	gr. iss	gr. ij
Hydrargyri chloridum corrosivum[1]	gr. $\frac{1}{12}$	gr. $\frac{1}{200}$	gr. $\frac{1}{120}$	gr. $\frac{1}{100}$	gr. $\frac{1}{60}$
" chloridum mite—(purgative)	gr. x	gr. ss	gr. j	gr. iss	gr. ij
(alterative)	gr. $\frac{1}{12}$	gr. $\frac{1}{30}$	gr. $\frac{1}{30}$	gr. $\frac{1}{24}$	gr. $\frac{1}{20}$
Hydrargyrum cum cretâ	gr. x	gr. ss	gr. j	gr. iss	gr. ij
Infusum digitalis	f℥ij	gtt. vj	gtt. x	gtt. xv	gtt. xxv
Jalapa	gr. x	gr. ss	gr. j	gr. ij	gr. iij
Liquor ammonii acetatis	f℥ss	gtt. xv	gtt. xxv	gtt. xl	fʒj
" calcis	f℥j	fʒss	fʒj	fʒj	fʒij
" ferri nitratis	♏x	gtt. ss	gtt. j	gtt. iss	gtt. ij
" morphiæ sulphatis	fʒj	gtt. v	gtt. x	gtt. xv	gtt. xx
" potassii arsenitis	♏vj	gtt, ss	gtt. j	gtt. iss	gtt. ij
Magnesia	℈ij	gr. ij	gr. v	gr. viij	gr. xij
Magnesiæ carbonas	℈ij	gr. iij	gr. vj	gr. x	gr. xv
" sulphas	℥j	gr. xxv	gr. xl	ʒj	ʒiss
Mistura assafœtidæ	f℥ss	gtt. xx	gtt. xxx	fʒj	fʒiss
" cretæ	f℥ss	gtt. xx	gtt. xxx	fʒj	fʒij
Morphiæ sulphas	gr. $\frac{1}{4}$	gr. $\frac{1}{80}$	gr. $\frac{1}{50}$	gr. $\frac{1}{30}$	gr. $\frac{1}{20}$
Oleum chenopodii		gtt. ij	gtt. ij	gtt. iv	gtt. viij
" morrhuæ	f℥ss	gtt. xv	gtt. xx	fʒj	fʒjss
" ricini	f℥j	fʒss	fʒss	fʒj	fʒj
" terebinthinæ	♏x	♏j	♏j	♏ij	♏iij
Opium[2]	gr. j	gr. $\frac{1}{25}$	gr. $\frac{1}{15}$	gr. $\frac{1}{8}$	gr. $\frac{1}{5}$
Plumbi acetas	gr. ij	gr. $\frac{1}{10}$	gr. $\frac{1}{6}$	gr. $\frac{1}{4}$	gr. $\frac{1}{3}$
Potassii acetas	gr. xl	gr. ij	gr. iij	gr. v	gr. viij
" bicarbonas	gr. xxx	gr. iss	gr. iiss	gr. iv	gr. vj
" bitartras	ʒij	gr. vj	gr. x	gr. xv	gr. xxv
" bromidum	gr. xx	gr. iss	gr. iij	gr. iv	gr. vj
" carbonas	gr. xx	gr. j	gr. iss	gr. iiss	gr. iv
" chloras	gr. xx	gr. j	gr. iss	gr. iiss	gr. iv
" citras	gr. xx	gr. j	gr. iss	gr. iiss	gr. iv
" iodidum	gr. v	gr. $\frac{1}{4}$	gr. $\frac{1}{2}$	gr. j	gr. iss
Pulvis ipecacuanhæ compositus[2]	gr. x	gr. ss	gr. j	gr. iss	gr. ij
Quiniæ sulphas (tonic)	gr. ij	gr. $\frac{1}{10}$	gr. $\frac{1}{6}$	gr. $\frac{1}{4}$	gr. $\frac{1}{3}$
(antiperiodic)	gr. xv	gr. ij	gr. iij	gr. iij	gr. iv

[1] Young children have a certain amount of tolerance of mercurial preparations.

[2] Opium must be prescribed with the utmost caution to young children.

Doses for Young Children—Continued.

Article.	Adult dose.	Under one year.	One year.	Two years.	Four years.
Rheum . . .	gr. x	gr. $\frac{1}{2}$	gr. $\frac{3}{4}$	gr. j	gr. ij
Santoninum . .	gr. iij	gr. ss	gr. ss	gr. j	gr. ij
Scammonium . .	gr. x	gr. ss	gr. j	gr. iss	gr. ij
Senna . . .	ʒj	gr. iij	gr. v	gr. viij	gr. xij
Sodii bicarbonas . .	gr. xv	gr. j	gr. iss	gr. ij	gr. iij
" bromidum . .	gr. xv	gr. j	gr. iss	gr. ij	gr. iij
Spigelia . . .	ʒij	gr. v	gr. x	gr. xv	gr. xx
Spiritus ammoniæ aromaticus .	fʒj	gtt. vj	gtt. x	gtt. xv	gtt. xx
" ætheris nitrosi	fʒj	gtt. x	gtt. xv	gtt. xxv	gtt. xl
Strychnia . . .	gr. $\frac{1}{24}$	gr. $\frac{1}{200}$	gr. $\frac{1}{150}$	gr. $\frac{1}{120}$	gr. $\frac{1}{100}$
Sulphur . . .	℥ij	gr. vj	gr. x	gr. xv	gr. xxv
Syrupus ferri iodidi .	gtt. xx	gtt. j	gtt. ij	gtt. iij	gtt. iv
" ipecacuanhæ[1] .	fʒj	gtt. v	gtt. vij	gtt. xij	gtt. xviij
" rhei aromaticus .	f℥ss	gtt. xx	gtt. xxx	fʒss	fʒj
" sarsaparillæ compositus[2] . .	f℥ss	gtt. xx	gtt. xxx	fʒss	fʒ$\frac{2}{3}$
" scillæ . .	fʒss	gtt. ij	gtt. iv	gtt. vj	gtt. x
" scillæ compositus[3]	fʒss	gtt. ij	gtt. iv	gtt. vj	gtt. x
Tinctura camphoræ .	gtt. xxx	gtt. j	gtt. ij	gtt. iij	gtt. v
" digitalis . .	gtt. x	gtt. ss	gtt. j	gtt. iss	gtt. ij
" ferri chloridi .	gtt. xx	gtt. j	gtt. iss	gtt. ij	gtt. iv
" gentianæ composita . . .	fʒij	gtt. xij	gtt. xx	gtt. xxx	gtt. xlv
" hyoscyami . .	gtt. xl	gtt. ij	gtt. iij	gtt. v	gtt. viij
" krameriæ . .	fʒj	gtt. vj	gtt. x	gtt. xv	gtt. xxv
" nucis vomicæ .	gtt. x	gtt. ss	gtt. j	gtt. iss	gtt. ij
" opii[4] . . .	gtt. xxv	gtt. ss	gtt. j	gtt. ij	gr. iv
" " camphorata	fʒij	gtt. x	gtt. xv	gtt. xxv	gtt. xl
" " deodorata .	gtt. xx	gtt. ss	gtt. j	gtt. ij	gtt. iv
" veratri viridis[5] .	gtt. v	gtt. $\frac{1}{4}$	gtt. ss	gtt. j	gtt. iss
Vinum antimonii[6] .	fʒj	gtt. iv	gtt. vij	gtt. xij	gtt. xviij
" ipecacuanhæ (emetic) .	f℥ss	gtt xxx	fʒj	fʒj	fʒiss
Zinci oxidum . .	gr. v	gr. $\frac{1}{4}$	gr. ss	gr. $\frac{3}{4}$	gr. j
" sulphas (emetic)	gr. x	gr. ss	gr. j	gr. iss	gr. ij
" " (tonic) .	gr. j	gr. $\frac{1}{20}$	gr. $\frac{1}{12}$	gr. $\frac{1}{8}$	gr. $\frac{1}{5}$

[1] To produce an emetic action the dose must be increased.

[2] Chiefly employed as a vehicle.

[3] See cautionary remarks under antimonii et potassii tartras. Larger doses than are here given are necessary if an emetic action be desired.

[4] See opium for caution in regard to employment of opiates.

[5] Veratrum viride should be prescribed to young children with extreme caution.

[6] The doses are mentioned, but antimonials should not be prescribed to very young children.

Doses based on the Weight of the Patient.

This method of calculating the dose is an unusual one, but it seems to respond tolerably accurately to the test of experiment. In a large number of cases, the results attained will be singularly in unison with those arrived at by the processes already alluded to for young people. As children, however, vary so much in size, and the inconvenience of guessing or of procuring the actual weight may be an obstacle in the way of extreme accuracy of measurement of the dose, it is more desirable to adhere to the rules already laid down. As a matter of curiosity, it is well to know that, according to this method of calculation, and allowing the average weight of the adult to be 150 pounds, for whom the proper dose is assumed to be 1, the dose of medicine, as a general rule, must be increased or diminished in the proportion of the patient's weight to that number of pounds, a proportion represented by a fraction whose numerator is the patient's weight and whose denominator is 150.[1]

If a child at birth weighs 6 pounds, the approximate dose for it would be $\frac{6}{150}$ or $\frac{1}{25}$.

If it weighs 10 pounds, $\frac{10}{150}$ or $\frac{1}{15}$.

A child 2 years old, weighing 20 pounds, would require $\frac{20}{150}$, or about $\frac{1}{7}$ of an adult dose.

A child 12 years old, weighing 75 pounds, would require $\frac{75}{150}$, or $\frac{1}{2}$ of an average dose.

A person whose weight is 200 pounds should have $\frac{200}{150}$, or $1\frac{1}{3}$ of an average adult dose.

The modifications of the average dose demanded by a patient's idiosyncrasy, disease, and other conditions than age or weight, are not, of course, met by this rule.

[1] Prof. E. H. Clarke on A New Rule for Doses, Boston Med. and Surg. Journal, Sept. 26, 1872.

Doses of Remedies in General.

In the following list are given the doses of several hundred articles of the Materia Medica. The table has been carefully arranged by the author, and will doubtless be found serviceable to the practitioner.

Under the head of "Officinal Preparations," in this table, reference is made to the preparations of the U. S. Pharmacopœia, of 1880, of which the remedy is an important ingredient.

Under the heading "Approximate Metric Dose," is given as nearly as possible the dose of the remedy according to the metric system, corresponding, in each instance, with that given to it under the heading "Dose," according to the system in general use. The metric dose is given in grammes alone, the transposition of which into decigrammes, centigrammes, etc., may be readily made by the reader, if deemed desirable, according to the tables previously given. To avoid the apparent intricacy of the metric system, the approximate dose is alone mentioned. Thus absinthium is credited with a dose of 1.3 to 2.6 grammes, whereas the actual amount is 1.295 to 2.591 grammes. Usually this will be sufficiently explicit, except in the case of potent remedies, such as digitalinum, where even minute fractions of a gramme would be of consequence. The gramme, it must be remembered, is equal to 15.434 grains. Liquids are estimated according to the rule previously given (p. 31).

When the dose of a remedy is not mentioned in the following table, the article is not prescribed alone internally, but in some officinal preparation, or externally.

The doses of Tinctures, Syrups, Extracts, Infusions, etc., will be found separately detailed under "*Pharmacopœial Groups,*" on another page.

Name.	Dose.	Approximate metric dose. (Grammes.)	Officinal preparations, U. S. Pharmacopœia, 1880.
Absinthium	gr. xx–xl	1.3–2.6	Vinum.
Acacia.	....	....	Mucilago, syrupus.
Acetum	fʒj–iv	3.7–15.0	
Achillea	gr. xxx	2.0	
Acidum arseniosum	gr. $\frac{1}{30}-\frac{1}{10}$	.002–.006	Liquor.
" benzoicum	gr. x–xxx	.65–2.0	
" carbolicum	gr. j–ij	.06–.13	Unguentum.
" citricum	gr. v–xxx	.3–2.0	Syrupus.
" gallicum	gr. ij–v	.13–.3	Unguentum.
" hydriodicum dilutum	♏v–xxx	.3–2.0	Syrupus.
" hydrocyanicum dilutum	♏j–iss	.05–.08	
" hydrobromicum dilutum	fʒss	2.0	
" hydrochloricum dilutum	♏x–xx	6.–1.3	
" lacticum	fʒss–ij	2.0–7.5	Syrupus.
" nitricum dilutum	♏x–xx	.6–1.3	
" nitromuriaticum dilutum	♏x–xx	.6–1.3	
" phosphoricum dilutum	♏x–xxx	.6–2.0	
" salicylicum	gr. v x	.3–.65	
" sulphuricum aromaticum	♏x–xx	.6–1.3	
" sulphuricum dilutum	♏x–xxv	.6–1.6	
" sulphurosum	fʒj	3.75	
" tannicum	gr. $\frac{1}{4}$–iij	.02–.2	Collodium, trochisci, unguentum.
" tartaricum	ʒj–ij	4.0–8.0	Pulveres.
" valerianicum	♏v	.3	
Aconiti folia	gr. j–ij	.06–.13	
" radix	....	....	Abstractum, extracta, tinctura.
Aconitia	gr. $\frac{1}{100}-\frac{1}{60}$	.0006–.001	
Æther	fʒss–j	1.7–3.4	Spiritus.
Aletris	gr. x	.65	
Allium	ʒss–ij	2.0–8.0	Syrupus.
Aloe	gr. iij–xv	.2–1.0	Extractum, pilulæ, tinctura, vinum.
Aloin	gr. ij–iv	.13–.26	
Althæa			Syrupus.
Alumen	gr. x–xx	.65–1.3	
Aluminii et potassii sulphas	gr. x–xx	.65–1.3	
Ammonia	....	....	Aquæ, glycyrrhizinum, linimentum, spiritus.

Name.	Dose.	Approximate metric dose. (Grammes.)	Officinal preparations, U. S. Pharmacopœia, 1880.
Ammoniacum	gr. x–xxx	.65–2.0	Emplastra, mistura.
Ammonii acetas	....	....	Liquor.
" benzoas	gr. x–xxx	.65–2.0	
" bromidum	gr. v–xx	.3–1.3	
" carbazotas	gr. j–ij	06.–.13	
" carbonas	gr. v–xx	.3–1.3	Spiritus.
" chloridum	gr. v–xxx	.3–2.0	Trochisci.
" iodidum	gr. j–iij	.06–.2	
" phosphas	gr. x–xxx	.65–2.0	
" valerianas	gr. ij–x	.13–.65	
Amygdala amara	....	....	Aqua, syrupus.
" dulcis	....	....	Mistura, syrupus.
Amyl nitris	gtt. ij–iij	.1–.2	
Anethi fructus	gr. xv–lx	1.0–4.0	
Angustura	gr. x–xxx	.65–2.0	
Anisum	gr. xx–xxx	1.3–2.0	Aqua, spiritus.
Anthemis	gr. xxx–lx	2.0–4.0	
Antimonii et potassii tartras	gr. $\frac{1}{10}$–j	.006–.06	Syrupus, vinum.
" oxidum	....	....	Pulvis.
" sulphidum	gr. ij–x	.13–.65	
Antimonium sulphuratum	gr. j–ij	.06–.1	Pilulæ. (Emetic dose, gr. v–xx.)
Apiol	gr. ij–v	.13–.3	
Apocynum	gr. v–x	.3–.65	
Apomorphinæ hydrochloras	gr. $\frac{1}{16}$–$\frac{1}{8}$	.004–.008	
Aqua	....	....	Aquæ.
Aralia nudicaulis	gr. xxx	2.0	
" spinosa	gr. xx–xxx	1.3–2.0	
Argenti nitras	gr. $\frac{1}{4}$–j	.02–.06	
" oxidum	gr. ss–j	.03–.06	
Armoracia	gr. xxx	2.0	Tinctura.
Arnicæ flores	gr. v–xx	.3–1.3	
" radix	....	....	Emplastrum, extracta, tinctura.
Arsenici iodidum	gr. $\frac{1}{10}$	.006	Liquor.
Arum	gr. x	.65	
Asafœtida	gr. x	.65	Emplastrum, mistura, pilulæ, tinctura.
Asarum	gr. xx–xxx	1.3–2.0	
Asclepias	gr. xx–lx	1.3–4.0	
Aspidium	....	....	Oleoresina.
Atropina	gr. $\frac{1}{60}$–$\frac{1}{30}$	.001–.002	
Atropinæ sulphas	gr. $\frac{1}{60}$–$\frac{1}{30}$	.001–.002	
Aurantii cortex	....	....	Extractum, syrupus, tinctura.
" flores	....	....	Aqua, syrupus.
Auri cyanidum	gr. $\frac{1}{16}$–$\frac{1}{8}$	.004–.008	
" iodidum	gr. $\frac{1}{12}$–$\frac{1}{4}$	.005–.02	

Name.	Dose.	Approximate metric dose. (Grammes.)	Officinal preparations, U. S. Pharmacopœia, 1880.
Balsamum Peruvianum .	fʒ ss–j	2.5–5.0	
" tolutanum .	gr. x–xxv	.65–1.6	Syrupus, tinctura.
Belladonnæ folia . .	gr. j–ij	.06–.13	Extractum, tinctura, unguentum.
" radix . .	....	....	Abstractum, emplastrum, extractum, linimentum.
Benzoinum . . .	gr. x–xxx	.65–2.0	Tinctura.
Bismuthi subcarbonas .	gr. v–xx	.3–1.3	
" subnitras . .	gr. v–xx	.3–1.3	
" valerianas . .	gr. ss–ij	.03–.13	
Brayera	℥ ss	15.5	Extractum, infusum
Bryonia	....	....	Tinctura.
Buchu	gr. xx–xxx	1.3–2.0	Extractum.
Caffeinæ citras . . .	gr. j–ij	.06–.13	
Calamus	gr. xx–xl	1.3–2.6	Extractum.
Calcii bromidum . .	gr. x–xl	.65–2.6	
" carbonas præcipitatus . . .	gr. x–lx	.65–4.0	
" hypophosphis . .	gr. x–xxx	.65–2.0	Syrupus.
" lactophosphas .	gr. xx–xl	1.3–2 6	Syrupus.
Calendula . . .	....	....	Tinctura.
Calumba	gr. x–xxx	.65–2.0	Extractum, tinctura
Calx	....	....	Liquor, linimentum, syrupus.
" chlorata . . .	gr. ij–v	.13–.3	
Cambogia . . .	gr. ij–vj	.13–.4	Pilulæ.
Camphora . . .	gr. iij–xx	.2–1.3	Aqua, ceratum, linimenta, spiritus, tinctura.
" monobromata .	gr. ij–v	.13–.3	
Canella	gr. x–xxx	.65–2.0	Pulveres.
Cannabis indica . .	....	....	Extracta, tinctura.
Cantharis	gr. j–ij	.06–.13	Ceratum, charta, collodium, linimentum, tinctura.
Capsicum	gr. v–x	.3–.65	Emplastrum, extractum, oleoresina, tinctura.
Carbo animalis purificata .	gr. j–v	.06–.3	
" ligni . . .	ʒ j–iv	4.0–15.5	
Cardamomum . . .	....	....	Pulvis, tinctura.
Carum	gr. xx–xl	1.3–2.6	
Cascarilla	gr. xx–xxx	1.3–2.0	
Cassia fistula . . .	ʒ j–℥ j	4.0–31.0	
" Marilandica . .	ʒ ss–iij	2.0–12.0	
Castanea	ʒ ss–j	2.0–4.0	Extractum.
Castoreum . . .	gr. x–xxv	.65–1.6	
Catechu	gr. x–xxx	.65–2.0	Tinctura, trochisci.
Cataria	ʒ ij	8.0	
Cerii oxalas . . .	gr. j–ij	.06–.13	
Cetraria	gr. xxx–lx	2.0–4.0	Decoctum.

Name.	Dose.	Approximate metric dose. (Grammes.)	Officinal preparations, U. S. Pharmacopœia, 1880.
Chelidonium . . .	gr. xxx–lx	1.7–3.4	
Chenopodium . . .	gr. xx–xl	1.3–2.6	
Chimaphila . . .	....	....	Extractum.
Chinoidinum . . .	gr. ij–x	.13–.65	
Chirata	gr. xx	1.3	Extractum, tinctura
Chloral	gr. x–xl	.65–2.6	
Chloroformum purificatum	gtt. x–xx	.8–1.6	Mistura, spiritus.
Chrysorobinum . .	....	....	Unguentum.
Cimicifuga . . .	gr. xx–lx	1.3–4.0	Extractum, tinctura
Cinchona	gr. xv–lx	1.0–4.0	Extracta, infusum, tinctura.
Cinchoninæ sulphas . .	gr. j–x	.06–.65	
Cinchonidinæ sulphas .	gr. j–v	.06–.3	
Cinnamomum . . .	gr. x–xx	.65–1.3	Aqua, pulvis, spiritus, tinctura.
Codeina	gr. j–ij	.06–.13	
Colchici radix . . .	gr. ij–vj	.13–.4	Extractum, vinum.
" semen . . .	gr. ij–vj	.13–.4	Extractum, tinctura, vinum.
Colocynthis . . .	gr. v–x	.3–.65	Extractum.
Conii fructus . . .	....	....	Abstractum, extractum, tinctura.
" succus . . .	♏xxx–lx	1.7–3.4	
Copaiba	gtt. xx–fʒj	1.25–3.75	Massa, resina.
Coptis	gr. x–xxx	.65–2.0	
Coriandrum . . .	gr. xx–lx	1.3–4.0	
Cornus circinata . .	gr. xx–lx	1.3–4.0	
" Florida . . .	gr. xx–lx	1.3–4.0	Extractum.
" sericea . . .	gr. xx–lx	1.3–4.0	
Creasotum . . .	♏j	.06	Aqua.
Creta præparata . .	gr. x–xl	.65–2.6	Mistura, pulvis, trochisci.
Crocus	gr. x–xxx	.65–2.0	Tinctura.
Croton chloral . . .	gr. v–xv	.3–1.0	
Cubeba	gr. x–ʒij	.65–8.0	Extractum, oleoresina, tinctura, trochisci.
Cupri sulphas . . .	gr. ¼–ss	.016–.03	(Emetic dose, gr. ij–v.)
Cuprum ammoniatum .	gr. ¼–ss	.016–.03	
Cydonium. . . .	....	....	Mucilago.
Cypripedium . . .	gr. xv	1.0	Extractum.
Daturia	gr. $\frac{1}{100}$ – $\frac{1}{50}$	.0006–.0013	
Digitalis	gr. j	.06	Abstractum, extracta, infusum, tinctura.
Digitalinum . . .	gr. $\frac{1}{60}$ – $\frac{1}{30}$	.001–.002	
Dracontium . . .	gr. x–xx	.65–1.3	
Dulcamara . . .	gr. xxx–ʒj	2.0–4.0	Extractum.
Elaterinum . . .	gr. $\frac{1}{16}$ – $\frac{1}{12}$	.004–.005	Trituratio.
Elaterium . . .	gr. ¼ – ½	.016–.03	
Elaterium, Clutterbuck's .	gr. ⅛	.008	
Emetia	gr. $\frac{1}{12}$ – $\frac{1}{6}$	.005–.01	
Ergota	gr. xx–ʒj	1.3–4.0	Extracta, vinum.

Name.	Dose.	Approximate metric dose. (Grammes.)	Officinal preparations, U. S. Pharmacopœia, 1880.
Ergotina	gr. j–ij	.06–.13	
Erigeron	gr. xxx–ʒj	2.0–4.0	
Erythroxylon	....	....	Extractum.
Eucalyptus	gr. xxx–ʒj	2.0–4.0	Extractum.
Euonymus	....	....	Extractum.
Eupatorium	gr. xx–xxx	1.3–2.0	Extractum.
Euphorbia corollata	gr. iij–x	.2–.65	
" ipecacuanha	gr. x–xv	.65–1.0	
Ferri acetas	....	....	Tinctura.
" arsenias	gr. $\frac{1}{16}$	.004	
" et ammonii citras	gr. v–x	.3–.65	Liquor, vinum.
" " sulphas	gr. iij–xij	.2–.8	
" " tartras	gr. x–xxx	.65–2.0	
" bromidum	gr. v–xx	.3–1.3	Syrupus.
" carbonas	gr. v–xxx	.3–2.0	Massa, mistura, pilulæ.
" chloridum	gr. x–xx	.65–1.3	Liquor, mistura, tinctura.
" citras	gr. v–xx	.3–1.3	Liquor, syrupus.
" ferrocyanidum	gr. iij–v	.2–.3	
" hypophosphis	gr. ij–x	.13–.65	
" iodidum	gr. j–viij	.06–.5	Pilulæ, syrupus.
" lactas	gr. ij–x	.13–.65	Syrupus.
" nitras	....	....	Liquor.
" oxalas	gr. ij–v	.13–.3	
" oxidum hydratum	gr. v–xx	.3–1.3	Emplastrum, trochisci.
" phosphas	gr. v–x	.3–.65	Syrupus.
" et potassii tartras	gr. x–xxx	.65–2.0	
" pyrophosphas	gr. ij–vj	.13–.4	
" et quininæ citras	gr. v–xv	.3–1.0	Liquor, vinum.
" et strychninæ citras	gr. j–iij	.06–.2	
" subcarbonas	gr. v–xx	.3–1.3	Mistura.
" subsulphas	....	....	Liquor.
" tersulphas	....	....	Liquor.
" sulphas	gr. j–v	.06–.3	Mistura.
" " exsiccatus	gr. j–iv	.06–.26	Pilulæ.
Ferrum redactum	gr. ij–x	.13–.65	
Filix mas	ʒj–iij	4.0–12.0	
Fœniculum	gr. xx–xxx	1.3–2.0	Aqua.
Frangula	....	....	Extractum.
Frasera	gr. xxx–ʒj	2.0–4.0	
Galbanum	gr. x–xx	.65–1.3	Emplastrum, pilulæ.
Galla	gr. x–xx	.65–1.3	Tinctura, unguentum.
Gaultheria	....	....	Spiritus.
Gelsemium	gr. ij–iij	.13–.2	Extractum, tinctura

Name.	Dose.	Approximate metric dose. (Grammes.)	Officinal preparations, U. S. Pharmacopœia, 1880.
Gentiana	gr. x–xl	.65–2.6	Extracta, tinctura.
" Catesbæi . .	gr. xv–xxx	1.0–2.0	
Geranium . . .	gr. xx–xxx	1.3–2.0	Extractum.
Geum	gr. xx–ʒj	1.3–4.0	
Gillenia	gr. xx–xxx	1.3–2.0	
Glycerinum . . .	fʒj	5.0	Glycerita, mucilago.
Glycyrrhiza . . .	....	....	Extracta, glycyrrhizinum, mistura, pulvis, trochisci.
Gossypii radicis cortex .	....	....	Extractum.
Granati radicis cortex .	gr. xx–xxx	1.3–2.0	
Grindelia	....	....	Extractum.
Guaiaci resina . . .	gr. x–xxx	.65–2.0	Tincturæ.
Guarana	gr. xxx–ʒj	2.0–4.0	Extractum.
Gutta percha . . .	....	....	Liquor.
Hæmatoxylon . . .	....	....	Extractum.
Hamamelis . . .	....	....	Extractum.
Helianthemum . . .	ʒj–ij	4 0–8.0	
Helleborus . . .	gr. iij–xx	.2–1.3	
Heuchera	gr. v–xx	.3–1.3	
Humulus	gr. iij–xx	.2–1.3	Tinctura.
Hydrargyri chloridum corrosivum .	gr. $\frac{1}{16}$–$\frac{1}{8}$	.004–.008	
" chloridum mite	gr. ss–x	.03–.65	
" cyanidum . .	gr. $\frac{1}{16}$–$\frac{1}{4}$	.004–.016	
" iodidum rubrum	gr. $\frac{1}{16}$–$\frac{1}{4}$	.004–.016	Liquor.
" " viride .	gr. j–iij	.00–.2	
" nitras . .	....	....	Liquor, unguentum.
" oxidum flavum .	....	....	Oleatum, unguentum.
" " rubrum	....	....	Unguentum.
" subsulphas flava	gr. $\frac{1}{4}$–v	.016–.3	
" sulphidum rubrum . .	gr. v–xxx	.3–2.0	
Hydrargyrum . . .	....	....	Emplastrum, massa, unguentum.
" ammoniatum	....	....	Unguentum.
" cum cretâ .	gr. iij–xv	.2–1.0	
Hydrastis	....	....	Extractum, tinctura
Hyoscyami semen . .	gr. ij–v	.13–.3	
Hyoscyamus . . .	gr. v–x	.3–.65	Abstractum, extractum, tinctura.
Ichthyocolla . . .	....	....	Emplastrum.
Ignatia	....	....	Abstractum, tinctura.
Inula	gr. xx–ʒj	1.3–4.0	
Iodoformum . . .	gr. j–v	.06–.3	Unguentum.
Iodum	....	....	Liquor, tinctura, unguentum.

Name.	Dose.	Approximate metric dose. (Grammes.)	Officinal preparations, U. S. Pharmacopœia, 1880.
Ipecacuanha	gr. j–v	.06–.3	(Emetic dose, gr. xx-xxx.) Extractum, pulvis, syrupus, tinctura, trochisci, vinum.
Iris	gr. x–xx	.65–1.3	Extractum.
Jalapa	gr. x–xx	.65–1.3	Abstractum, pulvis, [resina.
Jaborandi. . . .	gr. xl–l	2.6–3.3	
Juglans	gr. x–xxx	.65–2.0	Extractum.
Juniperus	ʒj–ij	4.0–8.0	Spiritus.
Kamala	ʒj–iij	4.0–12.0	
Kino	gr. x–xxx	.65–2.0	Tinctura.
Krameria	gr. xx–xxx	1.3–2.0	Extracta, syrupus, tinctura, trochisci.
Lactucarium . . .	gr. v–xv	.3–1.0	Extractum, syrupus.
Lappa	ʒj	4.0	
Lavandula . . .	....	....	Spiritus, tinctura, vinum.
Leptandra . . .	gr. xx–ʒj	1.3–4.0	Extracta.
Limon	....	....	Spiritus, syrupus.
Liriodendron . . .	ʒss–ij	2.0–8 0	
Lithii benzoas . . .	gr. ij–v	.13–.3	
" bromidum . .	gr. v–xx	.3–1.3	
" carbonas . .	gr. iij–vj	.2–.4	
" citras . . .	gr. v–x	.3–.65	
" salicylas . . .	gr. ij–viij	.13–.5	
Lobelia	gr. v–xx	.3–1.3	Acetum, tinctura, extractum.
Lupulinum . . .	gr. v–x	.3–.65	Extractum, oleoresina.
Magnesia	gr. xx–ʒj	1.3–4.0	Pulvis, trochisci.
Magnesii carbonas . .	gr. xxx–ʒij	2.0–8.0	Mistura.
" citras. . .	....	....	Liquor.
" sulphas . .	℥ss–j	15.5–31.0	Infusum.
Magnolia	gr. xxx–ʒj	2.0–4.0	
Mangani oxidum nigrum .	gr. iij–xx	.2–1.3	
" sulphas . .	gr. v–xx	.3–1.3	
Manna	℥j–ij	31.0–62.0	Infusum.
Marrubium . . .	gr. xxx–ʒj	2.0–4.0	
Mastiche	....	....	Pilulæ.
Matico	gr. xxx–ʒij	2.0–8.0	Extractum, tinctura
Matricaria . . .	gr. xxx–ʒj	2.0–4.0	
Mentha piperita . .	....	....	Aqua, spiritus, vinum, trochisci.
" viridis . . .	....	....	Aqua, spiritus.
Mezereum . . .	gr. x	.65	Decoctum, extractum, unguentum.
Morphinæ acetas . .	gr. ⅛–¼	.008–.016	
" hydrochloras .	gr. ⅛–¼	.008–.016	

Name.	Dose.	Approximate metric dose. (Grammes.)	Officinal preparations, U. S. Pharmacopœia, 1880.
Morphinæ sulphas	gr. $\frac{1}{8}-\frac{1}{4}$	.008–.016	Pulvis, trochisci.
" valerianas	gr. $\frac{1}{8}-\frac{1}{4}$	.008–.016	
Moschus	gr. x–xx	.65–1.3	Tinctura.
Myristica	....	....	Pulvis, spiritus, tinctura.
Myrrha	gr. x–xxx	.65–2.0	Mistura, pilulæ, [tinctura.
Narceia	gr. j–ij	.06–.13	
Nectandra	gr. ij–v	.13–.3	
Nux vomica	gr. v	.3	Abstractum, extractum, tinctura.
Oleum æthereum	....	....	Spiritus.
" amygdalæ amaræ	♏$\frac{1}{4}$–ss	.015–.03	
" cajuputi	♏j–iij	.06–.18	
" chenopodii	♏iij–vj	.18–.36	
" juniperi	♏v–x	.3–.6	
" lini	f℥ j	30.0	
" morrhuæ	fʒ ij–iv	7.5–15.0	
" olivæ	f℥ j	30.0	
" origani	♏j–v	.06–.3	
" phosphoratum	♏iij–v	.18–.3	
" pimentæ	♏ij–v	.12–.3	
" ricini	fʒ ij–f℥ iss	7.5–45.0	
" rosmarini	♏ij–v	.12–.3	
" sabinæ	♏ij–v	.12–.3	
" sesami	fʒ ij–iv	7.5–15.0	
" succini rectificatum	♏v–x	.3–.6	
" terebinthinæ	♏v–f℥ ss	.3–15.0	
" tiglii	♏j	.06	
Opium	gr. j	.06	Acetum, extractum, emplastrum, pilulæ, pulvis, tinctura, trochisci, vinum.
Origanum	....	....	Vinum.
Pareira	gr. xxx–ʒj	2.0–4.0	Extractum.
Pepsinum	gr. v–x	.3–.6	Liquor.
Phosphorus	gr. $\frac{1}{50}-\frac{1}{30}$	.0013–.002	Pilulæ.
Physostigma	gr. ij	.13	Extractum, tinctura
Phytolaccæ radix	gr. ij–xxx	.13–2.0	
Picrotoxinum	gr. $\frac{1}{30}-\frac{1}{15}$	.002–.004	
Pilocarpinæ hydrochloras	gr. $\frac{1}{6}-\frac{1}{2}$	.01–.03	
Pilocarpus	....	....	Extractum.
Piper	gr. v–xx	.3–1.3	Oleoresina.
Piperina	gr. j–vj	.06–.4	
Pix Burgundica	....	....	Emplastrum.
" Canadensis	....	....	Emplastrum.
" liquida	....	....	Syrupus, unguentum.

Name.	Dose.	Approximate metric dose. (Grammes.)	Officinal preparations, U. S. Pharmacopœia, 1880.
Plumbi acetas . . .	gr. j–iij	.06–.2	Liquor.
" carbonas . .	....	....	Unguentum.
" iodidum . .	gr. $\frac{1}{4}$–ij	.016–.13	Unguentum.
Podophyllinum . .	gr. $\frac{1}{8}$–$\frac{1}{2}$	.008–.03	
Podophyllum . . .	gr. xx	1.3	Abstracta, extracta, resina.
Potassa	....	....	Liquor.
" sulphurata . .	gr. iij–x	.2–.65	
Potassii acetas . . .	ʒj–iv	4.0–15.5	
" arsenis . .	....	....	Liquor.
" bichromas . .	gr. $\frac{1}{4}$–$\frac{3}{4}$	.016–.05	
" bicarbonas . .	gr. x–ʒj	.65–4.0	
" bitartras . .	ʒj–℥ss	4.0–16.0	Pulvis.
" bromidum . .	gr. v–xx	.3–1.3	
" carbonas . .	gr. x–xxx	.65–2.0	Unguentum.
" " pura .	gr. x–xxx	.65–2.0	
" chloras . .	gr. xv–xxx	1 0–2.0	Trochisci.
" citras . . .	gr. xx–xxx	1.3–2.0	Liquor, mistura.
" cyanidum . .	gr. $\frac{1}{8}$	.008	
" ferrocyanidum .	gr. x–xv	.65–1.0	
" hypophosphis .	gr. x–xxx	.65–2.0	Syrupus.
" iodidum . .	gr. v–xv	.3–1.0	Unguentum.
" nitras . . .	gr. x–xxx	.65–2.0	Charta.
" permanganas .	gr. ss j	.03–.06	
" et sodii tartras .	℥ss–j	15.5–31.0	Pulvis.
" sulphas . .	ʒss–℥ss	2.0–15.5	
" sulphis . .	gr. xx–ʒj	1.3–4.0	
" tartras . .	ʒj–℥j	4.0–31.0	
Prinos	gr. xxx–ʒj	2.0–4.0	
Prunus	....	....	Confectio.
Prunus Virginiana . .	gr. xxx–ʒj	2.0–4.0	Extractum, infusum, syrupus.
Pulsatilla	gr. ij–v	.13–.3	
Pyrethrum . . .	gr. xxx–ʒj	2.0–4.0	Tinctura.
Quassia	gr. xx–ʒj	1.3–4.0	Extracta, tinctura.
Quercus alba . . .	gr. xxx–ʒj	2.0–4.0	
" tinctoria . .	gr. xxx–ʒj	2.0–4.0	
Quininæ sulphas . .	gr. ij–xv	.13–1.0	Syrupus.
" bisulphas . .	gr. ij–xv	.13–1.0	
" hydrobromas .	gr. ij–xv	.13–1.0	
" hydrochloras .	gr. ij–xv	.13–1.0	
" valerianas . .	gr. j–iij	.06–.2	
Quinidinæ sulphas . .	gr. iij–x	.2–.65	
Resina jalapæ . - .	gr. iv–viij	.26–.5	
" podophylli . .	gr. $\frac{1}{8}$–j	.008–.06	
" scammonii . .	....	....	Extractum.
Rheum	gr. v–xx	.3–1.3	Extracta, pulvis, pilulæ, mistura, syrupus, tinctura, vinum.

Name.	Dose.	Approximate metric dose. (Grammes.)	Officinal preparations, U. S. Pharmacopœia, 1880.
Rhus glabra	....	....	Extractum.
" toxicodendron	gr. ss–ij	.03–.13	
Rosa	....	....	Aqua, confectio, extractum, mel, syrupus, unguentum.
Rubia	gr. xxx	2.0	
Rubus	gr. xx–xxx	1.3–2.0	Extractum, syrupus.
Rumex	ʒj–ij	4.0–8.0	Extractum.
Ruta	gr. xv–xxx	1.0–2.0	
Sabadilla	gr. v–xx	.3–1.3	
Sabbatia	gr. xxx–ʒj	2.0–4.0	
Sabina	gr. v–xv	.3–1.0	Ceratum, extractum
Saccharum	....	....	Syrupus.
Salicinum	gr. ij–viij	.13–.5	
Salix	gr. xv–ʒj	1.0–4.0	
Salvia	gr. xx–xxx	1.3–2.0	Vinum.
Sambucus	ʒj–℥ss	4.0–15.5	
Sanguinaria	gr. x–xx	.65–1.3	Acetum, extractum, [tinctura.
Santonica	gr. x–xxx	.65–2.0	
Santoninum	gr. ij–iv	.13–.26	
Sapo	....	....	Emplastrum, linimentum.
Sarsaparilla	gr. xxx	2.0	Decoctum, extracta, syrupus.
Sassafras	....	....	Mucilago.
Scammonium	gr. v–xx	.3–1.3	Resina.
Scilla	gr. j–iij	.06–.2	Acetum, extractum,
Scoparius	gr. x–xv	.65–1.0	[syrupus, tinctura.
Scutellaria	gr. xxx–ʒj	2.0–4.0	Extractum.
Senega	gr. x–xx	.65–1.3	Abstractum, extractum, syrupus.
Senna	gr. xxx–ʒij	2.0–8.0	Confectio, infusum, pulvis, syrupus.
Serpentaria	gr. x–xxx	.65–2.0	Extractum, tinctura
Simaruba	gr. xx–ʒj	1.3–4.0	
Sinapis alba	ʒj	4.0	
" nigra	ʒj	4.0	Charta, linimentum.
Soda	....	....	Liquor.
" chlorata	....	....	Liquor.
Sodii acetas	gr. xx–ʒij	1.3–8.0	
" arsenias	gr. $\frac{1}{12}$–$\frac{1}{4}$	.005–.016	Liquor.
" benzoas	gr. x–xx	.65–1.3	
" bicarbonas	gr. x–ʒj	.65–4.0	Mistura, trochisci.
" bisulphis	gr. x–xxx	.65–2.0	
" boras	gr. xxx–xl	2.0–2.6	
" bromidum	gr. xx–ʒj	1.3–4.0	
" carbonas	gr. x–xxx	.65–2.0	
" " exsiccata	gr. v–xv	.3–1.0	
" chloras	gr. v–xxx	.3–2.0	

Name.	Dose.	Approximate metric dose. (Grammes.)	Officinal preparations, U. S. Pharmacopœia, 1880.
Sodii chloridum . .	gr. xx–℥ j	1.3–31.0	
" hypophosphis . .	gr. x–xxx	.65–2.0	Syrupus.
" hyposulphis . .	gr. x–xx	.65–1.3	
" iodidum . . .	gr. xx–xxx	1.3–2.0	
" nitras . . .	gr. x–xxx	.65–2.0	
" phosphas . . .	gr. xxx–℥ j	2.0–31.0	
" santoninas . .	....	....	Trochisci.
" salicylas . . .	gr. xv–xxx	1.0–2.0	
" sulphas . . .	℥ ss–℥ j	15.5–31.0	
" sulphis . . .	gr. x–ʒ j	.65–4.0	
" sulphocarbolas . .	gr. x–xv	.65–1.0	
Spigelia	ʒ j–ij	4.0–8.0	Extractum.
Spiræa	gr. v–xv	.3–1.0	
Statice	gr. x–xxx	.65–2.0	
Stillingia	gr. xv–xxx	1.0–2.0	Extractum.
Stramonii folia . . .	gr. ij	.13	
" semen . .	gr. j	.06	Extracta, tinctura, unguentum.
Strychnina . . .	gr. $\frac{1}{32}-\frac{1}{12}$	.002–.005	Syrupus.
Strychninæ sulphas . .	gr. $\frac{1}{32}-\frac{1}{12}$	.002–.005	Syrupus.
Styrax	gr. x–xx	.65–1.3	Tinctura.
Sulphur lotum . . .	ʒ j–iij	4.0–12.0	Pulvis, unguentum.
" præcipitatum .	ʒ j–iij	4.0–12.0	
" sublimatum . .	ʒ j–iij	4.0–12.0	Unguentum.
Sulphuris iodidum . .	gr. $\frac{1}{20}-\frac{1}{10}$	.003–.006	Unguentum.
Sumbul	....	....	Tinctura.
Tanacetum . . .	gr. xxx–ʒ j	2.0–4.0	
Taraxacum . . .	....	....	Extractum.
Terebinthina . . .	gr. xx–ʒ j	1.3–4.0	Linimentum.
Testa præparata . .	gr. x–ʒ j	.65–4.0	
Theina	gr. j–iij	.06–.2	
Tolu	....	....	Syrupus, tinctura.
Tormentilla . . .	gr. xxx–ʒ j	2.0–4.0	
Toxicodendron . . .	gr. ss–j	.03–.06	
Tragacantha . . .	....	....	Mucilago.
Triosteum . . .	gr. xx–xxx	1.3–2.0	
Triticum	....	....	Extractum.
Ulmus	....	....	Mucilago.
Uva ursi	gr. xx–ʒ j	1.3–4.0	Extractum.
Valeriana	gr. xxx–ʒ iss	2.0–6.0	Abstractum, extractum, tinctura.
Veratrina	gr. $\frac{1}{16}-\frac{1}{8}$	.004–.008	Oleatum, unguentum.
Veratrum album . .	gr. j–ij	.06–.13	
" viride . .	gr. j	.06	Extractum, tinctura
Viburnum . . .	....	....	Extractum.
Viola tricolor . . .	ʒ j–iv	4.0–15.5	
Xanthorrhiza . . .	gr. xx–xl	1.3–2.6	

Name.	Dose.	Approximate metric dose. (Grammes.)	Officinal preparations, U. S. Pharmacopœia, 1880.
Xanthoxylum . . .	gr. x–xxx	.65–2.0	Extractum.
Zinci acetas . . .	gr. ij–iv	.13–.26	
" bromidum . .	gr. ss–ij	.03–.13	
" chloridum . .	gr. j	.06	Liquor.
" oxidum . . .	gr. ij–x	.13–.65	Unguentum.
" phosphidum . .	gr. $\frac{1}{6}$	.01	
" sulphas . . .	gr. j–ij	.06–.13	(Emetic dose, gr. x–xxx.)
" valerianas . .	gr. j–ij	.06–.13	
Zingiber	gr. x–xx	.65–1.3	Extractum, oleoresina, pulvis, tinctura, trochisci.

Maximum Doses.

The following table, based on that of the Pharmacopœia Germanica,[1] exhibits the maximum doses of the potent remedial agents mentioned, and beyond which physicians in Germany are not allowed to prescribe unless they add the caution mark (!), thereby indicating that such a large dose is intentionally ordered.[2] It must not be forgotten that maximum doses are exceptional ones, not to be prescribed without due consideration, as they are generally beyond the doses to which the practitioner is accustomed. If left wholly to the discretion of the practitioner, without such a guide as to the amount proper to be prescribed, the dose will frequently be as large as can well be tolerated by the patient. The table is arranged in grammes, and their equivalent in grains, or, in the case of liquids, in minims, etc.:—

[1] Dr. Hermann Hager, *Commentar zur Pharmacopœia Germanica.* Berlin, 1874, ii, 910.

[2] Dorvault, *L'Officine*, cites a slightly different maximum dose for some of the agents named. It will be noticed that the German doses

	Maximum single dose.		Total maximum dose in 24 hours.	
	Grammes.	Grains.	Grammes.	Grains.
Acetum colchici	2.0	♏30	6.0	♏96
Acidum arseniosum	0.005	1/13	0.01	1/6
" carbolicum (crystal.)	0.05	3/4	0.15	2¼
" hydrocyanicum dilutum	0.05	♏1	0.20	♏4
Aconitum	0.004	1/16	0.03	6/13
Ammonii bromidum	3.0	45	10.0	154
" iodidum	0.5	7½	2.5	38.5
Antimonii et potassii tartras	0.2	3	1.0	15
Apomorphiæ murias	0.015	¼	0.05	¾
Aqua amygdalæ amaræ	2.0	♏30	7.0	♏105
Argenti nitras	0.03	6/13	0.2	3
Arsenici iodidum	0.02	⅓	0.05	¾
Atropia	0.001	1/65	0.003	1/22
Atropiæ sulphas	0.001	1/65	0.003	1/22
Auri et sodii chloridum	0.06	9/10	0.2	3
Barii chloridum	0.12	1¾	1.5	23
Belladonnæ folia	0.2	3	0.6	9
" radix	0.1	1½	0.4	6
Bismuthi subnitras	0.3	4½	1.5	23

are in a number of instances larger than those given by the French authority.

	Grammes.	Grains.
Aqua laurocerasi	2.00	♏30
Argenti nitras	0.02	⅓
Belladonnæ radix (pulv.)	0.15	2¼
Colocynthis	0.10	1½
Digitalis folia	0.20	3
Hydrargyri cyanidum	0.02	⅓
Hyoscyami folia	0.20	3
Nux vomica	0.10	1½
Opium	0.05	¾
Phosphorus	0.01	1/6
Potassii arsenias	0.005	1/13
Potassii cyanidum	0.03	6/13
Scillæ radix	0.20	3
Sodii arsenias	0.005	1/13
Toxicodendron	0.30	4½
Veratria	0.01	1/6
Zinci sulphas	0.15	2¼

	Maximum single dose.		Total maximum dose in 24 hours.	
	Grammes.	Grains.	Grammes.	Grains.
Brucia	0.1	$1\frac{1}{2}$	0.3	$4\frac{1}{2}$
Caffeina	0.15	$2\frac{1}{4}$	0.6	9
Cantharides	0.05	$\frac{3}{4}$	0.15	$2\frac{1}{4}$
Chloral	4.0	61	8.0	123
Codeinum	0.05	$\frac{3}{4}$	0.1	$1\frac{1}{2}$
Colchicia	0.005	$\frac{1}{13}$	0.02	$\frac{1}{3}$
Conia	0.001	$\frac{1}{65}$	0.003	$\frac{1}{22}$
Conii herba	0.3	$4\frac{1}{2}$	2.0	30
Creasotum	0.05	♏1	0.2	♏4
Croton chloral	1.5	23	5.0	77
Cupri acetas	0.1	$1\frac{1}{2}$	0.4	6
" sulphas	0.1	$1\frac{1}{2}$	0.4	6
" " in divided doses as an emetic	1.0	15	...	...
Cupri et ammonii sulphas	0.1	$1\frac{1}{2}$	0.4	6
Digitalinum	0.005	$\frac{1}{13}$	0.02	$\frac{1}{3}$
Digitalis folia	0.3	$4\frac{1}{2}$	1.0	15
Ferri iodidum	0.5	$7\frac{1}{2}$	3.0	45
Hellebori viridis radix	0.3	$4\frac{1}{2}$	1.2	18
Hydrargyri cyanidum	0.02	$\frac{1}{3}$	0.06	$\frac{9}{10}$
" chloridum corrosivum	0.03	$\frac{6}{13}$	0.1	$1\frac{1}{2}$
" iodidum rubrum	0.03	$\frac{6}{13}$	0.1	$1\frac{1}{2}$
" " viride (flavum)	0.06	$\frac{9}{10}$	0.4	6
" oxidum nigrum	0.25	$3\frac{3}{4}$	1.0	15
" " rubrum	0.03	$\frac{6}{13}$	0.1	$1\frac{1}{2}$
Hyoscyami folia	0.3	$4\frac{1}{2}$	1.0	15
" semen	0.3	$4\frac{1}{2}$	1.2	18
Iodoformum	0.3	$4\frac{1}{2}$	1.5	23
Lactucarium	0.03	$\frac{6}{13}$	1.2	18
Liquor potassii arsenitis	0.4	♏7	2.0	♏30
Morphia	0.03	$\frac{6}{13}$	0.12	$1\frac{3}{4}$
Morphiæ acetas	0.03	$\frac{6}{13}$	0.12	$1\frac{3}{4}$
" murias	0.03	$\frac{6}{13}$	0.12	$1\frac{3}{4}$
" sulphas	0.03	$\frac{6}{13}$	0.12	$1\frac{3}{4}$
Oleum tiglii	0.06	♏1	0.3	♏4
Opium	0.15	$2\frac{1}{4}$	0.5	$7\frac{1}{2}$
Phosphorus	0.015	$\frac{1}{4}$	0.06	$\frac{9}{10}$
Plumbi acetas	0.06	$\frac{9}{10}$	0.4	6

	Maximum single dose.		Total maximum dose in 24 hours.	
	Grammes.	Grains.	Grammes.	Grains.
Podophylliuum	0.1	$1\frac{1}{2}$	0.5	$7\frac{1}{2}$
Potassii bromidum . . .	5.0	77	15.0	231
" iodidum	2.0	30	8.0	123
Resina jalapæ	1.0	15	3.0	45
" scammonii	1.0	15	3.0	45
Sabadillæ fructus	0.25	$3\frac{3}{4}$	1.0	15
Santoninum	0.1	$1\frac{1}{2}$	0.5	$7\frac{1}{2}$
Stramonii folia	0.25	$3\frac{3}{4}$	1.0	15
" semen	0.25	$3\frac{3}{4}$	1.0	15
Strychnia[1]	0.01	$\frac{1}{6}$	0.03	$\frac{6}{13}$
Strychniæ nitras[1]	0.01	$\frac{1}{6}$	0.03	$\frac{6}{13}$
Syrupus ferri iodidi . . .	7.5	♏90	30.0	360
Toxicodendri folia	0.4	6	1.2	18
Veratri rhizoma	0.3	$4\frac{1}{2}$	1.2	18
Veratria	0.005	$\frac{1}{13}$	0.03	$\frac{6}{13}$
Vinum colchici	2.0	♏30	6.0	♏90
Zinci acetas	1.5	23	3.0	46
" chloridum	0.015	$\frac{1}{4}$	0.1	$1\frac{1}{2}$
" lactas	0.06	$\frac{9}{10}$	0.3	$4\frac{1}{2}$
" sulphas	0.06	$\frac{9}{10}$	0.3	$4\frac{1}{2}$
" " in divided doses as an emetic . .	1.2	18	...	...
" valerianas	0.06	$\frac{9}{10}$	0.3	$4\frac{1}{2}$

Having thus studied the doses of the various remedial articles in the practitioner's armamentarium, as usually administered through the channel of the stomach, we are now prepared to examine into the posological features characteristic of the same agents when administered through other surfaces or media, such as the skin, air-passages, rectum, vagina, uterus, and urethra, including a reference also to certain local applications, as gargles, eye-washes, etc. These topics will be discussed in continuation of the general subject of Doses.

[1] The doses of strychnia and its nitrate seem unusual and excessive (see table of doses, page 113).

Doses of Medicines administered Hypodermically.

The severity of the symptoms must be the main guide to the practitioner as to the quantity of the remedial agent he may desire to administer by subcutaneous injection. It is expedient, however, that he should be familiar with the doses given by this channel. As a general rule, and when not otherwise mentioned, distilled water is the menstruum employed, and extreme care should be taken that the solution is perfect, free from foreign or irritating substances, neither acid nor alkaline, prepared by the practitioner himself, fresh when used, and filtered. Dr. Joseph G. Richardson[1] has proposed the employment of salicylic acid for the prevention of fungous growths in solutions for hypodermic medication, especially those containing morphia.

The chief articles administered in this way are arsenic, atropia, caffein, conia, ergotine, hydrocyanic acid, mercurial preparations, morphia, nicotia, physostigma, quinia, and strychnia.[2]

ARSENIC.—The *liquor sodii arseniatis* is less irritating than Fowler's solution; five, ten, or fifteen minims may be injected every alternate day.

Arsenious acid has been injected in solution in doses of one to two centigrammes (gr. $\frac{1}{6}$–$\frac{1}{3}$) with good results.

ATROPIA, SULPHATE OF.—The following strengths of solutions have been employed: gr. $\frac{1}{4}$ to f℥j, of which ♏v = gr. $\frac{1}{48}$; gr. ss to f℥j, of which ♏iiss = gr. $\frac{1}{48}$; gr. j to f℥j, of which ♏j = gr. $\frac{1}{60}$.

[1] N. Y. Medical Record, Sept. 30, 1876.

[2] Roberts Bartholow, Manual of Hypodermic Medication, 2d edit., Philada., 1873; from which work many of the doses and formulæ of the various articles are quoted, and to which the reader is referred for their numerous therapeutic applications.

A safe subcutaneous dose of sulphate of atropia is gr. $\frac{1}{48}$. Children are less susceptible than adults, men than women. Atropia and morphia are often given together on account of their antagonistic toxical effects. (See Morphia.)

Caffein.—The subcutaneous dose is gr. j, which may be administered as follows:—

℞. Caffeinæ puræ, gr. vj;
Spiritûs vini rectificati,
Aquæ destillatæ, āā f℥j.—M.

Of this solution, ♏ xx = gr. j, the proper dose.

Or the citrate of caffein gr. j may be added to gtt. xxiv of pure glycerine.

Conia.—The following formula has been proposed:—

℞. Coniæ, gr. j;
Spiritûs vini rectificati, f℥ss;
Aquæ destillatæ, f℥iss.—M.

Of this solution ♏ j = gr. $\frac{1}{120}$, and the hypodermic dose would be ♏ j–ij. The solution decomposes easily, and should therefore be freshly prepared.

Ergotin.—This substance may be administered subcutaneously as follows:—

℞. Ergotinæ, gr. ij;
Spiritûs vini rectificati,
Glycerinæ puræ, āā f℥ss.—M.

Of this solution, ♏ v = gr. $\frac{1}{6}$.

A less irritating solution may be made by adding to 3 parts of ergotin, 7.5 parts each of glycerine and distilled water.

Hydrocyanic acid (dilute).—A safe dose is ♏ ij, which should not, as a rule, be exceeded.

MERCURY.—Soluble preparations are alone used.

Corrosive sublimate is administered in the proportion of a grain to the ounce of distilled water, of which solution, ℳ x = gr. $\frac{1}{48}$, a safe and usually sufficient dose.

Or, according to Liégeois:[1]—

℞. Hydrargyri chloridi corrosivi, gr. iij;
Morphiæ sulphatis, gr. iss;
Aquæ destillatæ, f℥iij.—M.

Of this solution, ℳ xv = gr. $\frac{1}{32}$, an appropriate quantity for a single injection.

It may also be given in an unirritating albuminous solution of corrosive sublimate in alkaline chlorides:—

℞. Hydrargyri chloridi corrosivi,
Ammonii chloridi, āā gr. viij;
Sodii chloridi, gr. xxx;
Aquæ destillatæ, f℥ss.—M.

Filter and add to a solution of the white of one egg in water sufficient to make f℥iv. Of this solution, ℳv contain gr. $\frac{1}{16}$ of the corrosive chloride of mercury.

Lewin[2] employs in the treatment of syphilis three different strengths of solutions, gr. ij, iv, and vj to f℥j of distilled water; the one of medium strength being that usually resorted to. Morphia, gr. $\frac{1}{10}$–$\frac{1}{8}$, may be added to relieve the pain attending the application. The smallest subcutaneous dose of corrosive sublimate used by him in these cases is gr. $\frac{1}{10}$, the largest gr. $\frac{3}{8}$.

The *iodide of mercury and sodium* is also used where a mercurial is indicated. in the proportion of gr. viij to

[1] Bulletin Général de Thérapeutique, Aug. 30, 1869.

[2] Treatment of Syphilis with Subcutaneous Sublimate Injections; Philada., 1873.

f℥j, of which 10 minims, usually a sufficient dose, are equal to gr. $\frac{1}{6}$.

MORPHIA.—The *acetate* may be dissolved with a minimum of acetic acid, in hot distilled water, in the proportion of gr. v to f℥j, of which ♏ j = gr. $\frac{1}{12}$. In severe pain, ♏ ij may be administered.[1]

Muriate of morphia may be administered in the strength of gr. iv to f℥j, or gr. x to f℥ij; according to Lawson,[2] a solid preparation requiring heat to dissolve it. Two minims are equivalent to gr. $\frac{1}{6}$. The British Pharmacopœia has a formula for its subcutaneous injection, the strength being gr. v to f℥j, of which ♏ j = gr. $\frac{1}{12}$.

Sulphate of morphia is preferable in the proportion of gr. ij to f℥j; the subcutaneous dose being gr. $\frac{1}{12}$–$\frac{1}{2}$, the smaller dose being the best to commence with. The dose for children, in whom it is seldom employed hypodermically, is gr. $\frac{1}{30}$ to $\frac{1}{10}$.

When morphia and atropia are combined, a larger quantity of the former is borne without inconvenience. A solution may be made, in which ♏ v = gr. $\frac{1}{4}$ of morphia and gr. $\frac{1}{96}$ of atropia. Morphia gr. $\frac{1}{2}$ may be safely injected with gr. $\frac{1}{48}$ or $\frac{1}{24}$ of atropia, on account of their mutual antagonism.

NICOTIA.—This may be prescribed in a solution of gr. $\frac{1}{4}$ to f℥j of water, of which ♏ iv = gr. $\frac{1}{60}$, the proper subcutaneous dose.

PHYSOSTIGMA.—The extract is given in the proportion of gr. ij to f℥j, of which ♏ x = gr. $\frac{1}{3}$, the proper dose with which to commence its employment hypodermically.

[1] Anstie, Practitioner, July, 1868, p. 37.

[2] Sciatica, Lumbago, and Brachialgia, their Nature and Treatment; London, 1872.

QUINIA.—The sulphate may be administered as follows:—

℞. Quiniæ sulphatis, ʒj;
Acidi sulphurici diluti, ♏ xl;
Aquæ destillatæ, f℥j.—M.

Of this solution ♏ xv–xxx is the dose.

A solution of the sulphate of quinia, gr. viij in ether f℥j, has also been proposed, but this soon decomposes by evaporation of the ether.

STRYCHNIA.—The sulphate is used in the proportion of gr. ij to f℥j, of which ♏ v = gr. $\frac{1}{48}$; or gr. ij to fʒij, of which ♏ j = gr. $\frac{1}{60}$. The maximum dose is gr. $\frac{1}{24}$, but a smaller dose, as gr. $\frac{1}{60}$ to $\frac{1}{48}$, is safer, and therefore preferable.

Doses of Atomized Fluids for Inhalation.

In the treatment of certain diseases of the throat and respiratory organs, the introduction of atomized or pulverized fluids—in other words, of solutions of various medicinal substances in the form of spray—has been highly extolled. It would doubtless be employed more frequently as a remedial process if the practitioner was more generally informed as to the appropriate strength of the solution, which is to be thrown as spray upon the morbid surface. Supposing that he is already in possession of the proper spray-apparatus, the following table will give an idea of the doses in which the remedies may be resorted to:—

Acidum carbolicum, gr. i–ij.
" hydrocyanicum dilutum, ♏ ij.
" lacticum, ♏ xxx.
" sulphurosum, fʒij–viij.
" tannicum, gr. iij–xx.
Alumen, gr. v–xxx.
" exsiccatum, gr. iij–xx.
Ammonii chloridum, gr. v–lx.
Aqua laurocerasi, ♏ v–xx.
Argenti nitras, gr. i–x.
Cupri sulphas, gr. i–vj.
Extractum belladonnæ, gr. $\frac{1}{4}$–j.
" cannabis Indicæ, gr. $\frac{1}{4}$–ij.
" conii, gr. v–x.

Extractum conii fluidum, ♏ iij–viij.
" hyoscyami fluidum, ♏ iij–x.
" opii, gr. ss–v.
" " aquosum, gr. $\frac{1}{4}$–$\frac{1}{2}$.
Ferri et ammonii sulphas, gr. iij–vj.
" subsulphas (Monsel's salt), gr. ss–x.
" perchloridum, gr. $\frac{1}{8}$–ij.
" sulphas, gr. i–ij.
Glycerina, q. s.
Hydrargyri chloridum corrosivum, gr. $\frac{1}{16}$–$\frac{1}{4}$.
Liquor calcis, fʒj–ij.
" " saccharatus, fʒj–iv.
" ferri subsulphatis, gtt. x–xx.
" iodinii compositus, ♏ ij–xv.
" picis, fʒj–ij.
" potassii arsenitis, ♏ iij–xv.
" sodæ chlorinatæ, ♏ xxx–lx.
Morphiæ acetas, gr. $\frac{1}{12}$–$\frac{1}{4}$.
" sulphas, gr. $\frac{1}{12}$–$\frac{1}{4}$.
Oleum terebinthinæ, ♏ i–v.
Plumbi acetas, gr. ij–vj.
Potassii bromidum, gr. ij–x.
" carbonas, gr. x–ʒij.
" chloras, gr. v–xv.
" iodidum, gr. ij–x.
" permanganas, gr. ij–iv.
Quiniæ sulphas, gr. $\frac{1}{4}$–ij.
Soda chlorinata, ʒss–j.
Sodii boras, gr. v–xx.
" chloridum, gr. v–xl.
Tinctura cannabis Indicæ, ♏ v–x.
" ferri perchloridi, ♏ v–xxx.
" iodinii, ♏ iij–xv.
" " composita, ♏ x–xxx.
" opii, ♏ iij–xx.
Zinci sulphas, gr. iij–x.

Doses of Medicines in the form of Gargles.

The following list furnishes the practitioner a convenient guide to the selection of appropriate local applications in affections of the mouth and throat, in which they are indicated, and suggests the desirable strength of each. No rules are here deemed necessary, as he is supposed to be already familiar with the therapeutic virtues of the remedies to be employed.

The quantity specified for each article is for a *pint* of water, in direct solution, or decoction, etc., according to the degree of solubility :—

Acetum, fʒij–iv.
Acidum carbolicum, gr. xl–ʒij.
" muriaticum, fʒij.
" nitricum, ♏ xxx–xl
" salicylicum, gr. xl–ʒj.
" sulphuricum, ♏ x–xx.
" tannicum, gr. xl–ʒij.
Alumen, ℥ss–j.
" exsiccatum, ʒij–iij.
Ammonii chloridum, ʒij–iv.
Aqua ammoniæ, f℥ss.
" chlorinii, f℥ij.
Calx chlorinata, ʒj–iij.
Capsicum, ʒiij–vj.
Catechu, ℥ss.
Chloroformum, fʒj–ij.
Creasotum, ♏ xl–fʒj.
Cupri sulphas, gr. xx.
Cuprum ammoniatum, gr. xx.
Extractum cubebæ fluidum, f℥ss–j.
" gallæ fluidum, f℥ss–j.
" granati fluidum, f℥ss–j.
" krameriæ fluidum, f℥ss–j.
" quercûs albæ fluidum, f℥ss–j.
" xanthoxyli fluidum, f℥ss–j.

Gallæ, ʒij.
Hydrargyri chloridum corrosivum, gr. iv–v.
" cyanidum, gr. x. to Oj of barley water.
Infusum cinchonæ compositum, q. s.
Kino, ℥ss.
Liquor ammonii acetatis, f℥ij.
" plumbi subacetatis, ♏xxx.
" sodæ chlorinatæ, f℥ss–j.
Plumbi acetas, ʒij.
Potassii chloras, ℥ss–j.
" nitras, ℥j.
" permanganas, gr. xxx–ʒj.
Quercus alba, ℥j.
Quiniæ sulphas, gr. xx–xxx.
Salvia, ℥j.
Sodii boras, ʒiij–vj.
" chloras, ʒiij–vj
" hyposulphis, ℥iss–ij.
" sulphis, ℥j–ij.
Tinctura capsici, f℥j.
" catechu, f℥j.
" cinchonæ composita, f℥j.
" cubebæ, f℥j.
" ferri chloridi, f℥ss–j.
" gallæ, f℥ss–j.
" iodinii, fʒij–iv.
" kino, f℥ss–j.
" krameriæ, f℥ss–j.
" myrrhæ, f℥j–ij.
Zinci sulphas, gr. xxx–ʒij.

Many of the above-mentioned solutions may also be appropriately employed as *mouth washes* in various pathological conditions of that cavity. It may be desirable, in order to render them more agreeable for such local application, to incorporate with them additional flavoring materials, such as mel boracis, etc., or to combine several ingredients in the same prescription.

Doses of Medicines for Collyria or Eye-washes.

In ophthalmic medication much greater delicacy is of course required in the selection of the appropriate agents and their doses. The following list will facilitate the practitioner in the choice of a remedy and also indicate to him the usual dose in which it is to be prescribed.

The solution is in distilled water, preferably rose-water, in a *fluidounce* of which the quantity specified is to be dissolved, unless otherwise stated :—

Acetum, q. s.
Acidum hydrocyanicum dilutum, ♏v–x.
" tannicum, gr. ij–x.
Alumen, gr. ij–viij.
" exsiccatum, gr. j–iv.
Ammonii chloridum, gr. ij–x.
Aqua camphoræ, fʒvj to fʒij liquor ammonii acetatis.
" rosæ, q. s.
Argenti nitras, gr. j–iij.
Atropiæ sulphas, gr. $\frac{1}{4}$–ij.
Auri chloridum, gr. $\frac{1}{4}$.
Barii chloridum, gr. x.
Cadmii sulphas, gr. j–iij.
Calx chlorinata, gr. j–iij.
Conia, gtt. j–iij.
Creasotum, gtt. j–iij.
Cupri sulphas, gtt. j–iij.
Cydonium (in infusion), q. s.

Extractum belladonæ, gr. ij–iv.
" opii, gr. ij–v.
Ferri sulphas, gr. j–iij.
Glycerina, q. s.
Hydrargyri chloridum corrosivum, gr. ss.
Liquor ammonii acetatis, fʒss with fʒss of rose-water.
" plumbi subacetatis, ♏x.
Morphiæ murias, gr. j–ij.
" sulphas, gr. j–ij.
Plumbi acetas, gr. j–v.
Potassii carbonas, gr. ij–vj.
" chloras, gr. v–xv.
" iodidum, gr. vj–viij.
Potassii iodidum, gr. iij; iodinium, gr. $\frac{1}{8}$.
Sassafras medulla (in infusion), q.s.
Sodii boras, gr. x–xv.
" chloridum, gr. j–v.
Strychnia, gr. ij.
Tinctura aconiti, ♏v–xx.
" arnicæ, ♏v–xxx.
Vinum antimonii, fʒj.
" opii, fʒj.
Zinci acetas, gr. j–ij.
" iodidum, gr. j–ij.
" oxidum, gr. vj–x.
" sulphas, gr. ij–x.

Doses of Medicines for Injection into the Urethra.

The quantity mentioned is intended for solution in a *fluidounce* of distilled water.

Acidum carbolicum, gtt. ss–ij.
" hydrocyanicum dilutum, gtt. j–ij.
" nitricum, gtt. ij–iij.
" tannicum, gr. iij–v.
Argenti nitras, gr. ss–x.
Copaiba, ♏xv; mucilago acaciæ, fʒss; aqua calcis ad f℥j.
Creasotum, gtt. ss–ij.
Cubeba, gr. xxx.
Cupri sulphas, gr. j.
Cuprum ammoniatum, gr. ss.
Ergota, gr. xxx.
Ferri iodidum, gr. ss.
Hydrargyri chloridum corrosivum, gr. x (inject fʒj).
Kino, gr. ij–iv.
Liquor calcis, q. s.
" plumbi subacetatis, ♏x–xv.
Morphiæ acetas, gr. iss–ij.
" sulphas, gr. iss–ij.
Opium, gr. iss–ij.
Plumbi acetas, gr. v–xx.
Potassii chloras, gr. vj–viij.
" sulphuretum, gr. v.
Zinci acetas, gr. j–ij.
" chloridum, gr. j–ij.
" sulphas, gr. iij–x.

Doses of Medicines for Injection into the Vagina.

The amount mentioned is intended for solution in a *pint* of water, unless otherwise stated. In gonorrhœa of the female, many of the solutions already mentioned under "Urethral Injections," which may not be repeated in this place, are also applicable, as a general rule, for vaginal injection, but the proportion of the active ingredient, and especially the quantity of solution employed, must be increased.

Acidum carbolicum, ʒss–j.
" gallicum, gr. xx–ʒj.
" salicylicum, ʒj.
" tannicum, gr. xx–ʒj
Alumen, ʒj–iv.
Ammonii chloridum, ʒij–iv.
Aqua chlorinii, f℥iv.
Argenti nitras, gr. v–xx.
Catechu, ℥ss.
Copaiba, fʒvj; mucilago acaciæ, f℥iss; aqua calcis ad Oj.
Creasotum, ♏x–fʒss.
Cubeba, ℥ss–j.
Cupri sulphas, gr. x–xxx.
Cuprum ammoniatum, gr. x.
Ergota, ℥j.
Extractum hæmatoxyli, ℥j.
Ferri iodidum, ℥ss.
Ferri sulphas, gr. xxx–ʒij.
" et ammonii sulphas, ʒj.
Galla, ℥j.
Kino, ℥ss.
Krameria, ℥ss.
Liquor ferri subsulphatis, fʒij–iv.
" plumbi subacetatis, fʒj–ij.
" sodæ chlorinatæ, fʒj.
Plumbi acetas, gr. x–xx.
Potassii chloras, ℥j.
" nitras, ℥ss–j.
" permanganas, gr. xx.
Quercus alba, ℥ss.
Sodii hyposulphis, ℥j–ij.
" sulphis, ʒij–iv.
Tinctura ferri chloridi, f℥ss–j.
Zinci chloridum, gr. v–vij.
" sulphas, gr. ʒj–ij.

Doses of Medicines in the form of Suppositories.

The excipient usually employed in the formation of suppositories is oleum theobromæ, or cacoa butter, on account of its possessing the desirable consistence and fusibility for the purpose. Suppositories for young children should not weigh more than five or ten grains; for adults, they may weigh twenty-five or thirty grains. The U. S. Pharmacopœia recommends thirty grains, the British Pharmacopœia only fifteen. The usual dose of the active ingredient of the suppository may be from one and a half to two times that of the same medicine administered by the mouth. In city practice the physician usually mentions the quantity of the medicine in his prescription, leaving the exact size of the suppository to the manipulation of the pharmacist; or the latter keeps on hand a full line of ready-made suppositories in anticipation of the needs of the practitioner.

The general subject of suppositories includes those intended for introduction into the rectum, vagina, uterus and urethra.

Doses for Rectal Suppositories.

The quantity mentioned of each article is intended to be mixed with an excipient, preferably cacoa butter (oleum theobromæ), according to the rules and manipulations familiar to pharmacist and physician.[1]

Acidum carbolicum, gr. j–iv.
Acidum gallicum, gr. v–x. (See Opium.)
Acidum tannicum, gr. iij–x. (See Extractum belladonnæ, Extractum stramonii, Morphiæ sulphas, Opium, Plumbi acetas.)
Aloe purificata, gr. ij–x.
Aloin, gr. j ; sapo, gr. v.
Alumen, gr. v–xv.
Argenti nitras, gr. j.
Assafœtida, gr. v–x. (See Extractum ergotæ.)
Camphora, gr. x.
Chloral, gr. v.
Creasotum, ♏ $\frac{1}{4}$–ss.
Cupri acetas, gr. ij.
" sulphas, gr. ij.
Elaterium, gr. ss.
Extractum belladonnæ, gr. $\frac{1}{4}$–ij.
Extractum belladonnæ, gr. $\frac{1}{4}$–j ; extractum opii, gr. ss–ij.
Extractum belladonnæ, gr. $\frac{1}{4}$–ss ; plumbi acetas, gr. ij–iij.
Extractum belladonnæ, gr. j ; acidum tannicum, gr. iij.
Extractum belladonnæ, gr. ij ; morphiæ sulphas, gr. ss.
Extractum conii, gr. ss–ij.
" ergotæ (Squibb's), gr. ij–x.
Extractum ergotæ, gr. v ; assafœtida, gr. v.
Extractum hyoscyami, gr. iij–v. (See Opium.)
Extractum krameriæ, gr. v–x.
" nucis vomicæ, gr. ss–ij.
" opii, gr. j. (See Extractum belladonnæ.)
Extractum opii aquosum, gr. $\frac{1}{4}$–ij.
" rhei, gr. xv.
" stramonii, gr. j.
Extractum stramonii, gr. j ; plumbi acetas, gr. ij.
Extractum stramonii, gr. j ; acidum tannicum, gr. v.
Ferri perchloridum, gr. ij.
" subsulphas, gr. j–iij.
Gallæ. (See Opium.)
Gambogia, gr. iij–vj.
Hydrargyri chloridum mite, gr. v–x. (See Santoninum.)
Iodoformum, gr. iij.
Ipecacuanha, gr. ij–x.
Kino, gr. ij–v.
Morphiæ acetas, gr. $\frac{1}{12}$–j.
" murias, gr. $\frac{1}{12}$–j.
" sulphas, gr. $\frac{1}{12}$–j. (See Extractum belladonnæ.)
Morphiæ sulphas, gr. ss ; acidum tannicum, gr. iij.
Oleum theobromæ.
Opium, gr. $\frac{1}{20}$–iv. (See Pulvis ipecacuanhæ compositus.)
Opium, gr. j ; acidum gallicum, gr. ij.
Opium, gr. j–ij ; acidum tannicum, gr. ij–v.
Opium, gr. j ; extractum hyoscyami, gr. ij–iv.
Opium, gr. j ; galla, gr. v.
Opium, gr. j–ij ; plumbi acetas, gr. ij–v.
Plumbi acetas, gr. ij–v. (See Opium, Extractum belladonnæ, Extractum stramonii.)
Plumbi acetas, gr. ij ; acidum tannicum, gr. iij.

([1] For the officinal suppositories, *Suppositoria*, U. S. Phar., see *Pharmacopœial Groups.*)

Plumbi iodidum, gr. ij.
Pulvis ipecacuanhæ compositus, gr. j–x.
Quiniæ sulphas, gr. j–iv.
Resina podophylli, gr. $\frac{1}{4}$–j.
Santoninum, gr. ij–v.
Santoninum, gr. ij; hydrargyri chloridum mite, gr. v.
Sapo.
Sodii sulphas, ʒj.
Tinctura assafœtidæ, ♏xl.
Unguentum hydrargyri, gr. v.
Zinci oxidum, gr. viij–x.
Zinci sulphas exsiccata, gr. ij.

Doses for Vaginal Suppositories.

These conical preparations for the introduction of remedies *per vaginam* usually weigh about a drachm or more; and are shaped like a minié bullet, but somewhat larger. The quantity mentioned of each article is the proper dose for a suppository:[1]—

Acidum carbolicum, ♏ij.
" gallicum, gr. x.
" salicylicum, gr. v.
" tannicum, gr. v–x.
" tannicum, gr. vj; opium, gr. ij.
Aconitia, gr. $\frac{1}{36}$.
Alumen, gr. xv.
" gr. xv; catechu, gr. xv.
Ammonii bromidum, gr. xv.
" chloridum, gr. ij–iv.
Argenti nitras, gr. j.
Atropia, gr. $\frac{1}{20}$.
" gr. $\frac{1}{20}$; potassii bromidum, gr. x.
" gr. $\frac{1}{18}$; plumbi iodidum, gr. v.
Bismuthi subnitras, gr. xv.
Chloral, gr. x–xv.
Creasotum, ♏$\frac{1}{4}$–ss.
Extractum aconiti, gr. iss.
Extractum belladonnæ, gr. j–ij.
" belladonnæ, gr. ij; plumbi iodidum, gr. v.
" conii, gr. xv.
" hyoscyami, gr. ij–iv.
" nucis vomicæ, gr. ss–ij.
" opii, gr. iij.
Ferri perchloridum, gr. iij–v.
" subsulphas, gr. ij–v.
" sulphas, gr. x.
Hydrargyri oxidum rubrum, gr. ij.
lodinium, gr. ij.
Iodoformnum, gr. v–x.
Matico, gr. x.
Morphiæ murias, gr. ss–iss.
" sulphas, gr. ss–iss.
Morphiæ sulphas, gr. j; acidum tannicum, gr. v–x.
Opium, gr. iss–iij.
Plumbi acetas, gr. ij–vij.

[1] As elsewhere stated, suppositories are usually made with oleum theobromæ as the excipient, but Dr. Meadows, in his address before the British Medical Association in 1871, remarks: "Inasmuch as it is no part of the function of the vaginal mucous membrane to digest fats, and as fats without digestion cannot be absorbed, and are apt, moreover, to hinder the absorption of other substances, it is desirable, I think, that we should not use greasy substances of any kind. For this reason I long ago gave up the employment of cacoa butter, and I now invariably use, as the basis of the pessary, gelatin and glycerine, into which we can put any ingredient we wish." Tannic acid, and other substances incompatible with gelatin, cannot, however, be thus administered.

Plumbi acetas, gr. v ; opium, gr. ij.
" iodidum, gr. v–x.
" iodidum gr. v ; atropiæ sulphas, gr. $\frac{1}{20}$.
Potassii chloras, gr. v–xv.
" bromidum, gr. x.
" permanganas, gr. iij.
Potassii iodidum, gr. v–x.
Sodii boras, gr. xv.
" carbonas, gr. xv.
Unguentum hydrargyri, gr. xx–xxx.
Zinci oxidum, gr. xv.
" sulphas exsiccata, gr. iij.

Vaginal suppositories are also made *hollow*, of gelatine and glycerine, the medicated ingredient being introduced in the shell, or the powder may be placed in the interior of the hollow suppository.

Doses for Uterine Suppositories.

Suppositories for introduction into the cervical canal are cylindrical in shape, and about two inches long, having a diameter similar to a No. 9 male catheter. They should weigh about fifteen grains:—

Acidium gallicum, gr. j.
" gallicum, opium, āā gr. j.
" tannicum, gr. j.
" tannicum, opium, āā gr. j.
Argenti nitras, gr. j.
Cupri sulphas, gr. ss.
Extractum belladonnæ, gr. ij.
Extractum opii aquosum, gr. ij.
Ferri perchloridum, gr. j.
Morphiæ murias or sulphas, gr. j.
Plumbi acetas, gr. j.
Zinci sulphas exsiccata, gr. j.

Intra-uterine Pencils have also been devised, made of a combination of gelatin and glycerin, and medicated. They soon dissolve and act directly on the mucous surfaces of the uterus. They resemble a short bougie, about the diameter of a goosequill, sufficiently firm and elastic to be introduced without breaking.

Acidum carbolicum, gr. j–iv.
Acidum carbolicum, gr. ij.
  Liq. iodin. comp., gr. ss.
Ergotinæ, gr. v–viij.
Ext. belladonnæ alc., gr. j–ij.
Ext. opii aquos., gr. j–ij.
Hydrastis Canad., gr. v.
Iodoformum, gr. ij–v.
Liq. iodinii comp., gr. ij.
Morphiæ sulphas, gr. ss.
Morphiæ sulphas, gr. $\frac{1}{4}$.
  Ext. gelsem. fluid. gr. ij.
Zinci acetas, gr. ij–iv.
Zinci sulphas, gr. i–viij.
Zinci sulphas, gr. ij.
  Acidum carbolicum, gr. j.
Zinci sulphas, gr. ij.
  Acidum carbolicum, gr. j.
  Hydrastis Canad., gr. v.
Zinci sulphas, gr. ij.
  Ext. belladonnæ, gr. ss.
  Iodoformum, gr. ij.
  Liq. iodinii comp., gr. ss.
  Morphiæ sulphas, gr. ss.
Zinci sulphas, gr. ij.
  Ext. belladonnæ, gr. ss.

They may be retained in position by a small plug of absorbent cotton in the os.

Solid caustic crayons are more powerful than the intra-uterine pencils. They are made of the solid, medicating ingredient, such as alum, sulphate of zinc, etc., moulded into a short crayon, about $1\frac{1}{2}$ inch long and $\frac{3}{16}$ inch in diameter.

Doses for Urethral Suppositories (*Soluble Bougies*).

This form of treatment of gonorrhœa and gleet consists of firm smooth cylinders, three or six inches long, of cacoa butter, or gelatine and glycerine, with the remedial agent incorporated in it. Well oiled, it may be introduced by the patient into the urethra, preferably at bedtime, and will dissolve in about ten minutes. The bougie may be retained by slips of adhesive plaster.[1]

Acidum boracicum, gr. i–ij.
" gallicum, gr. j.
" gallicum, opium, āā gr. j.
" tannicum, gr. j.
" tannicum, opium, āā gr. j.
Argenti nitras, gr. $\frac{1}{4}$–j.
Bismuthi subnitras, gr. x.
Cupri sulphas, gr. ss.
Extractum aconiti, gr. j.
" belladonnæ, gr. iss–ij.
" gelsemii fluidum, gr. v.
" krameriæ, gr. j.
" opii aquosum, gr. iss–ij.
Ferri perchloridum, gr. ss–j.
Hydrastis Canadensis, gr. v.
Iodoformum, gr. j.
Morphiæ murias or sulphas, gr. ss–j.
Plumbi acetas, gr. ss–j.
" acetas, gr. ss; bismuthi subnitras, gr. x.
" acetas gr. j; extractum opii aquosum, gr. j.
Zinci acetas, gr. ss–j.
Zinci acetas, gr. ss–j; extractum opii aquosum, gr. j.
" chloridum, gr. $\frac{1}{4}$–ss.
" chloridum, gr. $\frac{1}{4}$; extractum opii aquosum, gr. j, or extractum belladonnæ, gr. j.
" salicylas, gr. ss.
" sulphocarbolas, gr. ss.
" sulphas, gr. ss–j.
" sulphas, gr. ss–j; extractum opii aquosum. gr. j, or extractum belladonnæ, gr. j.
" sulphas, gr. j; extractum belladonnæ, gr. j; extractum opii aquosum, gr. j.
" sulphas, gr. ss–j; morphiæ sulphas, gr. $\frac{1}{4}$.
sulphas, gr. ss; extractum opii aquosum, gr. j; extractum matico fluidum, gr. ss.
" sulphas, gr. ss–j; acidum carbolicum, gr. $\frac{1}{4}$–ss.

[1] Sir Henry Thompson, Lancet, May 12, 1866.

Doses for Enemata.

The following simple rules should guide the practitioner in the employment of enemata:—

1. Unless the remedy thus applied is excessively potent, three times as much of it should be injected *per anum* as would otherwise be administered by the mouth.

2. When it is desirable to retain the injection, the total amount of fluid should be small, not more than two or three fluidounces, and slowly injected, so that the bowel will not be excited to reject it. On the other hand, a large quantity should be used, as will be presently observed, when the object is to produce an evacuation of the bowels. A mucilaginous menstruum may sometimes be necessary, such as starch, barley-water, etc., to cover irritating qualities of the drug or to shield the bowel.

3. The appropriate quantity of fluid, at different ages, to be injected for purposes of evacuation, may be briefly stated as follows:—

For a very young infant, f℥j.

For a young child (1 to 6 years of age), for each year an additional f℥j.

For a child 6 to 15 years of age, varying with age, from f℥vj–x.

After 16 years of age, from f℥x–xvj or more.

The quantity mentioned for each article is intended for a *pint* of water, only when the object of the enema is to produce an evacuation; otherwise, the rule of injecting a very much smaller quantity of fluid must be adhered to. The therapeutic action of each substance, in the form of enema, is appended:—

Acetum	f℥j–iij	Astringent.
Acidum carbolicum . . .	♏ij–iv	Antiseptic and anthelmintic.
" tannicum . . .	gr. x–xx	Astringent.
Aloes	gr. x–xl	Purgative and anthelmintic.
Alumen	ʒij–iv	Astringent.
Amylum	℥ss	Emollient.
Anisum (in infusion) . . .	f℥j	Carminative
Anthemis (in infusion) . .	f℥j	Carminative.
Aqua ammoniæ	f℥ss	Stimulant.
" camphoræ	f℥j–ij	Antispasmodic.
Assafœtida	ʒj–ij	Antispasmodic.
Belladonna	gr. xv–xx	Antispasmodic.
Bismuthi subnitras . . .	gr xxx–ʒj	Astringent.
Calx chlorinata	ʒij–iv	Antiseptic.
Camphora	gr. xx–xl	Antispasmodic.
Carum (in infusion) . . .	f℥j	Carminative.
Catechu	gr. xxx–ʒj	Astringent.
Chenopodium	ʒss–j	Anthelmintic.
Creasotum	♏ij–iij	Antiseptic.
Ergota	ʒij–iij	
Extractum cinchonæ . . .	gr. xxx	Antiperiodic, tonic.
" krameriæ . . .	gr. xx	Astringent.
Fel bovinum	℥j	Purgative.
Fœniculum (in infusion) . .	f℥j	Carminative.
Galla	gr. xxx–ʒj	Astringent.
Kino	gr. xxx–ʒj	Astringent.
Krameria	gr. xx–xl	Astringent.
Liquor calcis	f℥iv–viij	Antiseptic.
" plumbi subacetatis . .	♏xl–fʒj	Astringent.
" sodæ chlorinatæ . .	f℥j	Antiseptic.
Magnesiæ sulphas . . .	℥j–iss	Purgative.
Mentha viridis (in infusion) .	f℥j–iss	Carminative.
Mistura assafœtidæ . . .	f℥ij–iv	Antispasmodic.
Moschus	gr. xv–xx	Antispasmodic.
Oleum lini	f℥ij–iv in Oss of water.	Purgative.
" morrhuæ	f℥ss–j	Nutritive.
" olivæ	f℥ij–iv in Oss of water.	Purgative.
" ricini	f℥j–ij in Oss of water.	Purgative.
" terebinthinæ . . .	fʒij–f℥ij	Stimulant, purgative.
Plumbi acetas	gr. x–xx	Astringent.
Potassii bicarbonas . . .	ʒij	Anthelmintic.
Quercus alba	℥j	Astringent.
Quiniæ sulphas	gr. x–xx in f℥iv of water.	Stimulant.

Salvia (in infusion)	f℥j	Carminative.
Sapo	℥ss	Purgative.
Sodii boras	ʒij–iv	Antiseptic.
" chloridum	℥ij–iv	Purgative.
" hyposulphis	ʒj	Antiseptic.
" sulphas	℥j in Oss	Purgative.
" sulphis	ʒj	Antiseptic.
Spigelia	gr. xxx	Anthelmintic.
Spiritus ætheris compositus .	fʒij–iij	Antispasmodic.
Tabacum	gr. xv–xx to f℥viij	Antispasmodic.
Tinctura assafœtidæ . . .	fʒiv–f℥j	Antispasmodic.
" capsici	fʒj to Oss of water.	Stimulant.
" opii	♏xx–fʒj	Antispasmodic.

A class of ENEMATA is officinal in the last edition of the British Pharmaeopœia, ineluding the following:—

Enema aloës.—℞. Aloës, gr. xl; potassii carbonatis, gr. xv; mueilaginis amyli, f℥v.

Enema assafœtidæ.—℞. Assafœtidæ, gr. xxx; aquæ destillatæ, f℥iv.

Enema magnesiæ sulphatis.—℞. Magnesiæ sulphatis, ℥j (avoir.); olei olivæ, f℥j; mueilaginis amyli, f℥xv.

Enema opii.—℞. Tineturæ opii, ♏xxx; mueilaginis amyli, f℥ij.

Enema tabaci.—℞. Tabaei foliorum, gr. xx; aquæ bullientis, f℥viij.

Enema terebinthinæ.—℞. Olei terebinthinæ, f℥j; mucilaginis amyli, f℥xv.

In addition to the articles just enumerated, quite a number of domestic remedies are similarly employed. No definite direetions are neeessary in regard to proportion or the quantity of these to be injected, other than the general rules already laid down. Among these may be mentioned the following:—

Alcoholie liquors, barley, beef-tea, ehocolate, eoffee, flaxseed, gum Arabie, lard, molasses, mutton suet, oatmeal, slippery elm, starch, sugar, tapioea, tea, wines, yelk of egg and yeast.

When the object of the administration of an enema is its *nutritive* effect only, the following formulæ may be used:[1]—

Beef-tea and Cream Enema.—Mix together from four to eight ounces of strong beef-tea, an ounce of cream, half an ounce of brandy or ounce and a half of port wine; administer two or three times in the twenty-four hours.

Or, mix four or six ounces of beef-tea or restorative soup (see *Dietetic Precepts*), prepared without acid, one ounce of cream, two teaspoonfuls of brandy, and ten grains of citrate of iron and quinia.

If brandy is not indicated, take beef-tea, soup, or milk and eggs beaten together, and thicken with corn flour.

Cod-liver Oil and Bark Enema.—Mix four ounces of milk, ounce of port wine, half-ounce of cod-liver oil, two drachms of tincture of yellow bark, twenty minims of liquid extract of opium. Administer every twelve hours.

Quinine and Solution of Beef Enema.—Take a tablespoonful of brandy, five grains of sulphate of quinia, teaspoonful of glycerine, two tablespoonfuls of cream, and from four to eight ounces of restorative soup or beef-tea. Administer every six or eight hours. If the rectum be irritable, add fifteen to twenty minims of liquid extract of opium.

Digested Meat Enema.—The *essence of meat*[2] should be given with the addition of a wineglassful of simple isinglass or gelatine jelly to a quarter of a pint of the essence of meat.

The whole must be warmed, by standing in a jar, which is placed in a saucepan and surrounded by a mixture half of boiling and half cold water. Ten grains of dry pepsin should be dissolved in a tablespoonful of warm water, and ten drops of muriatic acid or spirits of salts. This should then be stirred into the essence of meat, in the jar, and allowed to remain two hours. It may then be warmed again,

[1] Tanner, Practice of Medicine, 5th Amer. edit., 1872, p. 1053.

[2] See "Dietetic Preparations for the Sick," on another page.

by means of more water similarly mixed, and then administered. Laudanum may be added, under medical direction.

An ounce of sugar may be added to the above enema with great advantage. Ordinary lump sugar may be used, but the best kind to employ is *grape sugar*. If grape sugar cannot be procured, it will, in some cases, be worth all the trouble of making it, which may be done as follows:—

Procure from a chemist one drachm of strong sulphuric acid, diluted with twelve fluid ounces of water. Put this on the fire to boil, in an enameled saucepan or earthenware pipkin. While this is getting hot, mix a quarter of a pound of starch with sufficient lukewarm water to make it of the consistence of cream. When the acidulated water boils, add the starch gradually, stirring with a clean stick after each addition, and allowing it to boil up before more is added. When all has been mixed, boil for half an hour, and then add by degrees a teaspoonful of whiting. Take it off the fire and allow the sediment to subside; then pour off the nearly clear fluid. A wineglassful may be added to each enema.

Egg and Sugar Enema.—Take the yolks of two eggs; beat them up with a wineglassful of the cold solution of grape sugar and a wineglassful of hot water; or dissolve an ounce of grape sugar in two wineglassfuls of hot water. If it be impossible to get or make grape sugar, use an ounce of lump sugar.

Fat and Sugar Enema.—Take half an ounce of powdered gum Arabic; rub it up gradually in a mortar, with two tablespoonfuls of water and a pinch of carbonate of soda; then take two tablespoonfuls of olive or cod-liver oil, and rub them in, a little at a time, with the gum and water. Finally, stir in a wineglassful of hot solution of grape sugar, or an ounce of grape sugar or lump sugar dissolved.

Baths and how to Medicate them.

These vary in the quantity of material used to medi-

cate them, as they vary also in temperature. The simplest forms of unmedicated baths, classified chiefly according to temperature (Fahr.), are the following:—

Bath.	Water.	Vapor.	Air.
Cold	33° to 65°		
Cool	65° to 75°		
Temperate	75° to 85°		
Tepid	85° to 92°	90° to 100°	96° to 106°
Warm	92° to 98°	100° to 115°	106° to 120°
Hot	98° to 112°	115° to 140°	120° to 180°

The following formulæ will be found of practical value in a variety of cutaneous, hepatic, and other affections.[1]

Arsenical Bath.—℞. Sodii carbonatis, ℥iv; sodii arseniatis, gr. xx–xxxv; aquæ calidæ, Cong. xxx.

Or, ℞. Sodii chloridi, ℥j; sodii sulphatis, ℥j; sodii carbonatis, ℥ij; sodii arseniatis, gr. lii; aquæ calidæ, Cong. xxx.

Or, ℞. Potassi sulphureti, ℥iv; sodii arseniatis, gr. xxx–xl; aquæ calidæ, Cong. xxx.

Borax Bath.—℞. Sodii boratis, ℥iv; glycerinæ, f℥iij; aquæ calidæ, Cong. xxx.

Conium and Starch Bath.—℞. Extracti conii, ℥j; amyli pulv. ℔j; aquæ ferventis, Cong. xxx.

Or, the conium may be omitted, and a simple starch bath be employed.

Creasote Bath.—℞. Creasoti, f℥iij; glycerinæ, f℥iv; aquæ ferventis, Cong. xxx.

Gelatine Bath.—Dissolve ℔j of gelatine or common glue in a little boiling water, and add twenty gallons of hot water. To make it more efficacious, soak in it ℔j–ij of bran confined in a muslin bag.

[1] For several important suggestions in this place, the author is indebted to Tanner's Practice of Medicine, 5th Am. ed., Appendix, p. 1070.

Hydrochloric Acid Bath.—See Muriatic acid bath.

Hydrosulphuretted Bath.—See Sulphur bath.

Hyposulphite of Sodium Bath.—See Sulphur bath.

Iodine Bath.—℞. Iodinii, ʒj; potassii iodidi, ℥ss; liquoris potassæ, f℥ij; aquæ calidæ, Cong. xxx.

Or, ℞. Potassii iodidi, ʒvj; iodinii, ʒiij; aquæ calidæ, f℥xx. To be added to an ordinary bath.

Or, ℞. Potassii iodidi, ℈iv; iodinii, ℈ij; aquæ, f℥x. To be added to an ordinary bath for children.

Iron Bath.—℞. Ferri iodidi, ℥ij–iij; aquæ calidæ, Cong. xxv.

Or, ℞. Ferri sulphatis, ℥ss; aquæ calidæ, Cong. iv. For children.

Mercurial Vapor Bath.—The patient is seated on a chair, and covered with an oilcloth lined with flannel, which is supported by a proper framework. Under the chair are placed a copper bath containing water, and a metallic plate on which is put from 60 to 180 grains of bisulphuret of mercury, or of the gray or red oxide. In syphilitic affections of the skin, testes, and bones, five to thirty grains of the green iodide may be used, or twenty grains of the same salt with ninety of the bisulphuret. Spirit-lamps are lighted under the bath and plate, and the patient is thus exposed to the influence of heated air, steam, and mercurial vapor. In ten or fifteen minutes the lamps are to be extinguished, and the patient, gradually cooling, is to be rubbed dry.[1]

The plan of Mr. Henry Lee is much more simple. A tin case, made by instrument-makers, is used, containing a spirit lamp, and having in the centre, over the flame, a small tin plate, on which 15 to 30 grains of calomel are placed, and around this a sort of saucer filled with boiling

[1] Langston Parker on Syphilis, quoted in Tanner, *loc. cit.*

water. The lamp being lighted, the apparatus is placed under a common cane-bottom chair, on which the patient sits, enveloped, chair and all, in one or more large blankets for about twenty minutes, when the water and mercury will be found to have disappeared. It is better not to use a towel, as the calomel would be wiped off by it.

Muriatic Acid Bath.—℞. Acidi muriatici, f℥x; aquæ, Cong. l.

Mustard Foot Bath.—℞. Sinapis pulv. ℥ij–iv; aquæ ferventis, Cong. iv.

Nitromuriatic Acid Bath.—℞. Acidi muriatici, p. iij; acidi nitrici, p. ij. Mix carefully and slowly, and after an interval of fifteen minutes, add aquæ destillatæ, p. v. For a foot bath, add of the above f℥vj to two or three gallons of water at 98°; or, ℞. acidi nitrici, f℥ss; acidi hydrochlorici, f℥j; aquæ calidæ, Cong. iv. In a wooden bath.

For a full bath, add 64 fluidounces of the mixture first named to 5 pints of cold water, and then hot water enough to raise the temperature to 98°. In a wooden bath.

Or, ℞. Acidi nitrici, f℥iss; acidi hydrochlorici, f℥j–iij; aquæ calidæ, Cong. xxx. In a wooden bath.

Oak Bark Bath.—℞. Quercûs contusæ, ℔j; aquæ calidæ, Oij. Boil for half an hour, strain, and add to 3 gallons of warm water. For children.

Salt Water Bath.—℞. Sodii chloridi, ℔ss; aquæ tepidæ, Cong. iv. For a sponge bath.

Soda Bath.—℞. Sodii bicarbonatis, ℔j; aquæ ferventis, Cong. xxx.

Sulphur Bath.—℞. Potassii sulphureti, ℥iv; acidi muriatici, f℥ij; aquæ calidæ, Oj. To be poured into an ordinary bath.

Or, ℞. Sodii hyposulphitis, ℥i–iv; aquæ calidæ, Cong. j. To be poured into an ordinary bath.

Or, ℞. Potassii sulphureti, ℥iv; sodii hyposulphitis, ℥j; acidi sulphurici, f℥j; aquæ calidæ, Cong. xxx.

Or, ℞. Potassii sulphureti, ℥iv; aquæ calidæ, Cong. xxx.

Vapor Baths.—See "Suggestions for the Nursing of the Sick," on another page.

PHARMACOPŒIAL GROUPS

(From the U. S. Pharmacopœia of 1880),

SIMPLIFIED FOR READY REFERENCE.

However familiar the practitioner may be with the officinal preparations, from daily experience with the employment of tinctures, extracts, etc., he has, as a rule, only a partial knowledge of their relative doses. The Pharmacopœia specifies quantities and methods of manufacture, but is silent on the subject of the doses appropriate to each. In addition to the exact composition of each preparation, the practitioner wishes to know in what way he can handle the extract or the solution which the nicety of the pharmaceutist's art has perfected for him. With the view of assisting him in the proper use of the material thus set before him, the following arrangement of the various officinal groups has been made directly from the U. S. Pharmacopœia of 1880. Parts by weight have been substituted, in most cases, for the actual weights and measures of the preceding Pharmacopœia.[1]

[1] Should it be desirable to convert the amounts mentioned into the phraseology of the metric system, this must be done according to the rules for solids and liquids already laid down (pp. 29 and 31).

Abstracta (Abstracts).—These are dry, powdered extracts, introduced for the first time in the Pharmacopœia of 1880. They are just twice the strength of the crude drug, or about twice the strength of the corresponding fluid extract. Bearing this in mind, the practitioner will readily determine the proper dose for administration. In each abstract alcohol and sugar of milk are employed in the formula for its preparation.

NAME.	DOSE.	NAME.	DOSE.
Abstractum aconiti .	gr. ss–j	Abstractum jalapæ .	gr. x–xv
" belladonnæ	gr. ss–j	" nucis vomicæ	gr. j–ij
" conii . .	gr. j–ij	" podophylli .	gr. v–x
" digitalis .	gr. ss–j	" senegæ .	gr. j–iij
" hyoscyami .	gr. ij–iij	valerianæ .	gr. x–xx
" ignatiæ .	gr. ss–iss		

Aceta (Vinegars).—Diluted acetic acid is the solvent employed.

Acetum lobeliæ . .	♏xxx–fʒj	Acetum sanguinariæ .	♏xx–xxx
" opii . .	♏x–xv	" scillæ . .	♏xx–fʒj

Aquæ (Medicated Waters).—These are solutions of essential oils and gases in water.

Aqua ammoniæ .	♏x. Also for external use.	Aqua cinnamomi .	fʒss–j
" " fortior.		" creasoti . .	fʒj–iij
" amygdalæ amaræ	fʒij–iij	" destillata .	Used in making the other aquæ.
" anisi . . .	f℥j	" fœniculi . .	fʒss–j
" aurantii florum .	f℥ss	" menthæ piperitæ	fʒss–j
" camphoræ . .	f℥ss	" " viridis .	fʒss–j
" chlori .	For external use.	" rosæ .	Used as a vehicle.

Cerata (Cerates).—These external applications may be briefly mentioned. Their modus operandi and the indications for their use may be learned from their officinal names, the practitioner being, of course, familiar with the qualities thus suggested. They are—

Ceratum, or simple cerate.	Ceratum extracti cantharidis.
" camphoræ.	" plumbi subacetatis.
" cantharidis.	" resinæ.
" cetacei.	" sabinæ.

CHARTÆ (Papers).—The officinal preparations of this class are—

Charta cantharidis. Charta sinapis.
Charta potassii nitratis.

Two of these are intended as portable substitutes for the ordinary fly blister and mustard plaster.

COLLODIA.—Collodium is a solution of pyroxylin or gun cotton in ether, and three of its preparations are officinal—

Collodium cum cantharide. Collodium flexile.
Collodium stypticum.

CONFECTIONES (Confections).—These are medicinal substances mixed in an agreeable form with honey, syrup, etc. They are—

Confectio rosæ. Confectio sennæ, dose ʒ ij

DECOCTA (Decoctions).—Only two of these are officinal—

Decoctum cetrariæ. Decoctum sarsaparillæ compositum.

The dose of each is f℥ ij–iv.

ELIXIR.—Only one is officinal—

Elixir aurantii (elixir of orange or simple elixir).

EMPLASTRA (Plasters).—As a general rule, the practitioner does not desire to know the exact strength of this class of external applications, having confidence that the proper amount of active material has been placed in them to render them effective. Their officinal names will suggest the uses to which they may be applied. They are—

Emplastrum ammoniaci.
" " cum hydrargyro.
" arnicæ.
" asafœtidæ.
" belladonnæ.
" capsici.
" ferri.
" galbani.
" hydrargyri.

Emplastrum ichthyocollæ.
" opii.
" picis Burgundicæ.
" " Canadensis.
" " cum cantharide.
" plumbi.
" resinæ.
" saponis.

Extracta (Extracts).—The mode of preparation of the different officinal extracts varies greatly in the details, which are chiefly of interest to the pharmacist. It is therefore deemed advisable to refer here to the *doses* alone, the minuteness or magnitude of which will be a sufficient guide to the practitioner as to the strength of the extract.

Extractum aconiti, gr. ss–j.
" aloes aquosum, gr. ij–v.
" arnicæ radicis, gr. ij–v; used in making emplastrum arnicæ.
" belladonnæ alcoholicum, gr. $\frac{1}{8}$–$\frac{1}{4}$.
" cannabis Indicæ, gr. $\frac{1}{4}$–ss
" cinchonæ, gr. x–xx.
" colchici radicis, gr. j–ij.
" colocynthidis, gr. v–xxx.
" " compositum, gr. v–xxx.
" conii alcoholicum, gr. ss-j
" digitalis, gr. $\frac{1}{4}$.
" ergotæ, gr. v–xxx.
" euonymi, gr. j–iij.
" gentianæ, gr. x–xx.
" glycyrrhizæ.

Extractum glycyrrhizæ purum.
" hæmatoxyli, gr. x–xx.
" hyoscyami alcoholicum, gr. j–ij.
" iridis, gr. j–ij.
" juglandis, gr. v–x.
" krameriæ, gr. x–xx.
" leptandræ, gr. xx.
" malti, ʒj–iv.
" mezerei, for external use.
" nucis vomicæ, gr. ss–j.
" opii, gr. ss–j.
" physostigmatis, gr. $\frac{1}{16}$–$\frac{1}{4}$.
" podophylli, gr. j–iv.
" quassiæ, gr. j–iij.
" rhei, gr. v–x.
" stramonii, gr. $\frac{1}{4}$–ss.
" taraxaci, gr. xx–ʒj.

Extracta fluida (Fluid extracts).—The fluid extracts of the Pharmacopœia of 1880 are made, as usual, measure for weight; but the gramme and cubic centimetre have been substituted for the troy ounce and fluid ounce. They differ, therefore, about five per cent. in strength from those of the preceding Pharmacopœia. In the latter 100 troy ounces of the drug made 100 fluid ounces of fluid extract, whereas in that of 1880 they make 105.3 fluid ounces. The proportions being so definitely fixed, it is merely necessary to mention the doses.

Extractum aconiti fluidum, ♏ss.
" arnicæ radicis fluidum, ♏v–x.

Extractum aromaticum fluidum, ♏x–xx.

Extractum aurantii amaræ fluidum, ♏xv–xxx.
" belladonnæ fluidum, ♏j–ij.
" brayeræ fluidum, f℥ ss–j.
" buchu fluidum, ♏xxx–fʒj.
" calami fluidum, ♏v–xv.
" calumbæ fluidum, ♏xx–xl.
" cannabis Indicæ fluidum, ♏ss–j.
" capsici fluidum, ♏ss–j.
" castaneæ fluidum. fʒj–ij.
" chimaphilæ fluidum, ♏xx–xl.
" chiratæ fluidum, ♏xx–xxx.
" cimicifugæ fluidum, ♏xx–xl.
" cinchonæ fluidum, ♏xxx–fʒj.
" colchici radicis fluidum, ♏ij–vj.
" colchici seminis fluidum, ♏iij–vij.
" conii fluidum, ♏iij–v.
" cornus fluidum, ♏xv-xxx
" cubebæ fluidum. ♏xx–xl
" cypripedii fluidum, ♏xv
" digitalis fluidum, ♏j–ij.
" dulcamaræ fluidum, ♏xxx–fʒj.
" ergotæ fluidum, ♏xxx–f℥ ss.
" erythroxyli fluidum, ♏xx–fʒj.
" eucalypti fluidum, ♏v–x.
" eupatorii fluidum, ♏xx–fʒj.
" frangulæ fluidum, ♏x–xx
" gelsemii fluidum, ♏ij–iv.
" gentianæ fluidum, ♏x–xxx.
" geranii fluidum, ♏xx–fʒj.
" glycyrrhizæ fluidum, fʒj–iv.
" gossypii radicis fluidum, ♏xx–fʒj.
" grindeliæ fluidum, ♏xxx–fʒj.
" guaranæ fluidum, fʒj–ij.

Extractum hæmamelidis fluidum, ♏xxx.
" hydrastis fluidum, ♏xx–xxx.
" hyoscyami fluidum, ♏v-x
" ipecacuanhæ fluidum, ♏v–x.
" iridis fluidum. ♏v–x.
" krameriæ fluidum, ♏x-xl
" lactucarii fluidum, ♏v–xxx.
" leptandræ fluidum, ♏xx–fʒj.
" lobeliæ fluidum, ♏j–v.
" lupulinæ fluidum, ♏v–x.
" matico fluidum, ♏xx–xl.
" mezerei fluidum, for external use.
" nucis vomicæ fluidum, ♏ij–v.
" pareiræ fluidum, ♏xxx–fʒj
" pilocarpi fluidum, ♏xv–xxx.
" podophylli fluidum, ♏v–xv.
" pruni Virginianæ fluidum ♏xxx–fʒj.
" quassiæ fluidum, ♏v–x.
" rhei fluidum, ♏xx–xxx.
" rhois glabræ fluidum, ♏xxx–fʒj.
" rosæ fluidum, fʒj–ij.
" rubi fluidum, ♏xxx–fʒj.
" rumicis fluidum, ♏xxx–fʒj.
" sabinæ fluidum, ♏iij–vj; chiefly used externally.
" sanguinariæ fluidum, ♏ij–v.
" sarsaparillæ compositum fluidum, ♏xxx–fʒj.
" sarsaparillæ fluidum, ♏xxx–fʒj.
" scillæ fluidum, ♏ij–v.
" scutellariæ fluidum, ♏xxx–fʒj.
" senegæ fluidum, ♏ij–v.
" sennæ fluidum, fʒj–iv.
" serpentariæ fluidum, ♏xv–xxx.
" spigeliæ fluidum, fʒj–ij.
" stramonii fluidum, ♏j–ij.

Extractum stillingiæ fluidum, ♏xv-xl.
" taraxaci fluidum, fʒ j–ij.
" tritici fluidum, fʒ iij–vj.
" uvæ ursi fluidum, ♏xxx–fʒ j.
" valerianæ fluidum, ♏xxx–fʒ j.

Extractum veratri viridis fluidum, ♏j–iij.
" viburni fluidum, ♏xxx–fʒ j.
" xanthoxyli fluidum, ♏xxx–fʒ j.
" zingiberis fluidum, ♏v–xx.

Glycerita (Glycerites).—The solvent powers of glycerin are called into requisition in only two officinal preparations. They are employed externally.

Glyceritum amyli.
Glyceritum vitelli.

Infusa (Infusions).—Five of these are officinal—

Infusum brayeræ, f℥ iv–viij.
" cinchonæ, f℥ ij.
" digitalis, fʒ ij–iv.

Infusum pruni Virginianæ, f℥ ij.
" sennæ compositum, f℥ iv.

Linimenta (Liniments).—The medical uses of the members of this group are suggested from the officinal names, the effects of each article, when externally applied, being familiar to the physician. They are—

Linimentum ammoniæ.
" belladonnæ.
" calcis.
" camphoræ.
" cantharidis.

Linimentum chloroformi.
" plumbi subacetatis.
" saponis.
" sinapis compositum.
" terebinthinæ.

Liquores (Solutions).—The officinal aqueous solutions are given in the following syllabic list. Distilled water is the solvent.

Liquor acidi arseniosi, ♏ij–viij.
" ammonii acetatis, f℥ ss–j.
" arsenici et hydrargyri iodidi, ♏v–x.
" calcis, f℥ ss–ij.
" ferri acetatis, ♏ij–x.
" " chloridi, ♏ij–x.
" " citratis, ♏x.
" " nitratis, ♏vij–x.
" " et quiniæ citratis, ♏x–xx.
" " subsulphatis, externally styptic.

Liquor ferri tersulphatis, used to prepare the sesqui-oxide.
" guttæ perchæ, external use.
" hydrargyri nitratis, external use.
" iodi compositus, ♏v.
" magnesii citratis, half or the whole of the contents of the bottle.
" plumbi subacetatis, for external use.
" plumbi subacetatis dilutus, for external use.

Liquor pepsini, f℥ ss–ij.
" potassæ, ♏x–xxx.
" potassii arsenitis, ♏v.
" " citratis, f℥ ss.
" sodæ, ♏x–xxx.
Liquor sodæ chloratæ, gtt. xx–fʒj. also used externally.
" sodii arseniatis, ♏iij–v.
" " silicatis, for external use
" zinci chloridi, " "

MASSÆ (Masses).—Three of these are officinal—

Massa copaibæ, gr. x–xxx. Massa ferri carbonatis, gr. iij–v.
Massa hydrargyri, gr. ss–x.

MELLITA (Honeys).—The only officinal preparations made with honey, instead of sugar, are—

Mel despumatum, or clarified honey. Mel rosæ.

MISTURÆ (Mixtures).—The dose of each of the officinal mixtures in the following list is here given—

Mistura ammoniaci, f℥ ss–j.
" amygdalæ, *ad libitum.*
" asafœtidæ, f℥ ss–j.
" chloroformi, fʒ ij–v.
" cretæ, f℥ ss.
" ferri et ammonii acetatis, f℥ ss–j.
Mistura ferri composita, f℥ ss–ij.
" glycyrrhizæ composita, f℥ ss.
" magnesiæ et asafœtidæ, ♏xx.
" potassii citratis, f℥ ss.
" rhei et sodæ, fʒ j–iv.

MUCILAGINES (Mucilages).—These are—

Mucilago acaciæ.
" cydonii.
" sassafras medullæ.
Mucilago tragacanthæ.
" ulmi.

All of these, except mucilage of tragacanth, are employed, on account of their demulcent action, *ad libitum*, and also externally.

OLEATA (Oleates).—These combinations of oleic acid are two in number. They are employed externally.

Oleatum hydrargyri. Oleatum veratrinæ.

OLEORESINÆ (Oleoresins).—These preparations are solutions of the waxy and resinous constituents of the drug, produced by passing stronger ether through the powdered drug, in a covered displacement apparatus. They are—

Oleoresina aspidii, ♏x–xxx.
" capsici, ♏¼–ss: employed externally.
" cubebæ, ♏v–xxx.
Oleoresina lupulini, ♏ij–v.
" piperis, ♏¼–j.
" zingiberis, ♏j.

PILULÆ (Pills).—The following pills are officinal in the Pharmacopœia—

Pilulæ aloës.
" aloës et asafœtidæ.
" aloës et ferri (aloës and sulphate of iron).
" aloës et masticheს, Lady Webster's pills.
" aloës et myrrhæ.
" antimonii compositæ (calomel, sulphurated antimony and guaiac).
" asafœtidæ.
" catharticæ compositæ (compound extract of colocynth; abstract of jalap, calomel and gamboge).

Pilulæ ferri compositæ (myrrh, carbonate of sodium and sulphate of iron).
" ferri iodidi (iodine, reduced iron, etc.).
" galbani compositæ (galbanum, myrrh and asafœtida).
" opii (opium and soap).
" phosphori (phosphorus, althæa, glycerin, etc).
" rhei (rhubarb and soap).
" rhei compositæ (rhubarb, aloës and myrrh).

PULVERES (Powders).

Pulvis antimonialis (oxide of antimony, precipitated phosphate of calcium), gr. iij–viij.
" aromaticus (cinnamom, ginger, cardamom, nutmeg), gr. x–xxx.
" cretæ compositus (prepared chalk, acacia and sugar), for making chalk mixture.
" effervescens (tartrate of potassium and sodium, and bicarbonate of sodium, in one paper; tartaric acid in another; dissolve separately and mix).

Pulvis glycyrrhizæ compositus (senna, licorice, fennel, washed sulphur, sugar), gr. xxx–ʒj.
" ipecacuanhæ et opii (Dover's powder), gr. v–xv.
" jalapæ compositus (jalap and bitartrate of potassium), gr. xxx–ʒj.
" morphinæ compositus (sulphate of morphine, camphor, licorice, precipitated carbonate of calcium), gr. x.
" rhei compositus (rhubarb, magnesia and ginger), gr. xxx–ʒj.

RESINÆ (Resins).—But three of these preparations are officinal. They are made by the action of alcohol and water.

Resina jalapæ, gr. ij–v.
Resina podophylli, gr. $\frac{1}{8}$–ss.
Resina scammonii, gr. iv–viij.

SPIRITUS (Spirits).—But few of the following articles of this group are used medicinally, the doses of such being mentioned. Some of them are employed as flavoring agents: others as carminatives.

Spiritus ætheris, ♏xxx–f℥j.
" ætheris compositus, ♏xxx–f℥j.
" ætheris nitrosi, f℥ss–j.
" ammoniæ, ♏x; also for external use.
" ammoniæ aromaticus, ♏xx–f℥j.
" anisi, ♏xx–f℥ij.
" aurantii.
" camphoræ, ♏xx–xxx.
" chloroformi, f℥j.
" cinnamomi, ♏xxx–f℥iij.

Spiritus frumenti (whisky).
" gaultheriæ.
" juniperi, ♏xxx.
" " compositus, f℥j–f℥ss.
" lavandulæ, ♏xx–xxx.
" limonis.
" menthæ piperitæ, ♏v–xv.
" menthæ viridis, ♏v–xv.
" myrciæ.
" myristicæ. ♏xxx–f℥ij.
" odoratus (cologne water).
" vini gallici (brandy).

Suppositoria (Suppositories).—It is desirable that the practitioner should know the strength of such of the articles of this group as he wishes to employ. The quantity of the active ingredient in each suppository is left to his discretion, and general directions are therefore given in the Pharmacopœia only for the preparation of suppositories as a class.

Syrupi (Syrups).—In the following list it has not been deemed necessary to mention the composition of each officinal syrup, its name indicating its principal ingredient.

Syrupus, used as a vehicle and for making other syrups.
" acaciæ, f℥j–iij; chiefly used as a vehicle.
" acidi citrici, f℥j–iij; chiefly used as a vehicle,
" acidi hydriodici, ♏xx–xl
" allii, f℥j–iv; chiefly used as a vehicle.
" althææ, f℥j–iv.
" amygdalæ, f℥j–iv; chiefly used as a vehicle.
" aurantii, f℥j–ij; chiefly used as a vehicle.
" aurantii florum, f℥j–ij; chiefly used as a vehicle.
" calcii lacto-phosphatis, f℥ij–iv.
" calcis, f℥j.
" ferri bromidi, ♏xxx–f℥j.

Syrupus ferri iodidi (iodine and iron wire), ♏v–xx.
" ferri, quininæ et strychninæ phosphatum, f℥j.
" hypophosphitum, f℥j–ij.
" " cum ferro, f℥j–ij.
" ipecacuanhæ, ♏xxx–f℥j, expectorant; f℥ss–j, emetic.
" krameriæ, f℥ij–iv.
" lactucarii, f℥ij–iij.
" limonis, f℥j–iij; chiefly used as a vehicle.
" picis liquidæ, f℥j–ij.
" pruni Virginianæ, f℥ij–iv.
" rhei, f℥j, for a young child.
" rhei aromaticus, f℥j, for a young child.

Syrupus rosæ, fʒj.
" rubi, fʒj–ij.
" rubi idæi, *ad libitum.*
" sarsaparillæ compositus f℥ ss.
" senegæ, fʒj–ij.
" scillæ, fʒj.

Syrupus scillæ compositus (squill, senega, tartrate of antimony and potassium, etc.), ♏xx–xxx.
" sennæ, fʒj–iv.
" tolutanus, fʒj–ij.
" zingiberis, fʒj.

TINCTURÆ (Tinctures).—The doses of this officinal group of important remedies are given in the following schedule. As the object is to afford a tangible mode of reference to the practitioner, for such articles as he may desire to employ, no attempt at classification, according to therapeutic qualities or pharmaceutical peculiarities, has been made. The menstruum is usually alcohol or diluted alcohol.

Tinctura aconiti, ♏j–iij.
" aloës, fʒj–iv.
" " et myrrhæ, fʒj–ij.
" arnicæ florum, ♏x–xxx.
" " radicis, external use.
" asafœtidæ, ♏xxx–fʒj.
" aurantii amaræ, fʒj–ij.
" " dulcis,
" belladonnæ, ♏x–xx.
" benzoini, ♏xx–xxv.
" " composita, ♏xxx
" bryoniæ, fʒj–ij.
" calendulæ, used externally.
" calumbæ, fʒj–iv.
" cannabis Indicæ, ♏x–xx.
" cantharidis, ♏iij–vj.
" capsici, ♏xxx.
" cardamomi, fʒj–ij.
" " composita, fʒij–iij.
" catechu composita, ♏xxx–fʒj.
" chiratæ, fʒj–ij.
" cimicifugæ, fʒj–iv.
" cinchonæ, fʒj–iv.
" " composita (Huxham's tincture), fʒj–iv.
" cinnamomi, fʒj–iij.
" colchici, ♏xxx–fʒj.
" conii, ♏xx–xxx.

Tinctura croci, fʒj–iij.
" cubebæ, fʒj–ij.
" digitalis, ♏x–xv.
" ferri acetatis, ♏xx–fʒj.
" ferri chloridi, ♏x–xxv.
" gallæ, fʒj–iij.
" gelsemii, ♏x.
" gentianæ composita, fʒj–iij.
" guaiaci, fʒj.
" " ammoniata, fʒj–ij.
" herbarum recentium.
" humuli, fʒj–iij.
" hydrastis, ♏xx–xl.
" hyoscyami, ♏xx–fʒj.
" ignatiæ, ♏x–xv.
" iodi, ♏v–x; used externally.
" ipecacuanhæ et opii, ♏x.
" kino, fʒj–ij.
" krameriæ, fʒj–ij.
" lavandulæ composita, ♏xxx–fʒj.
" lobeliæ, ♏xxx–fʒj.
" matico, fʒj.
" moschi, ♏xxv–fʒij.
" myrrhæ, ♏xv–xxv.
" nucis vomicæ, ♏v–x.
" opii, ♏x.
" " camphorata, fʒj–iv.
" " deodorata, ♏x.
" physostigmatis, ♏xv–xxv

Tinctura pyrethri, external use.
" quassiæ, fʒj–ij.
" rhei, fʒj–iij.
" rhei aromatica, ♏xxx–fʒj.
" rhei dulcis, fʒij–iij.
" sanguinariæ, ♏xx–xl.
" saponis viridis, for external use.
" scillæ, ♏x–xx.

Tinctura serpentariæ, fʒj–iij.
" stramonii, ♏xv–xxv.
" sumbul, ♏xv–xl.
" tolutanæ, fʒj–ij.
" valerianæ, fʒj–iij.
" valerianæ ammoniata, ♏xxx–fʒj.
" vanillæ.
" veratri viridis, ♏iij–vj.
" zingiberis, ♏viij–xxx.

TRITURATIO (Trituration).—This is prepared by thorough trituration of the substance with sugar of milk. The only one officinal is

Trituratio elaterini, gr. ss.

TROCHISCI (Lozenges).—This group has been made officinal, as offering an agreeable method of administration, especially to children. The dose indicated is the proportion of the remedy given in each troche.

Trochisci acidi tannici, gr. j.
" ammonii chloridi, gr. ij.
" catechu, gr. j.
" cretæ, gr. iv.
" cubebæ, gr. ss oleoresin of cubebs.
" ferri, gr. v hydrated oxide of iron.
" glycyrrhizæ et opii, gr. $\frac{1}{20}$ extract of opium.
" ipecacuanhæ, gr. $\frac{1}{4}$.
" magnesiæ, gr. iij.

Troehisei krameriæ, gr. j extract of krameria.
" menthæ piperitæ, ♏ $\frac{3}{20}$ oil of peppermint.
" morphinæ et ipecacuanhæ, gr. $\frac{1}{40}$ morphia, gr. $\frac{2}{25}$ ipeeacuanha.
" potassii chloratis, gr. v.
" sodii bicarbonatis, gr. iij.
" sodii santoninatis, gr. j.
" zingiberis, ♏ij tincture of ginger.

UNGUENTA (Ointments).—The following are officinal—

Unguentum (lard and yellow wax).
" acidi carbolici.
" acidi gallici.
" acidi tannici.
" aquæ rosæ, cold cream, (oil of almond, spermaceti, white wax, rose water).
" belladonnæ.
" chrysarobini.
" diachylon.
" gallæ.
" hydrargyri.
" " ammoniati.

Unguentum hydrargyri nitratis.
" " oxidi flavi.
" " oxidi rubri.
" iodi.
" iodoformi.
" mezerei.
" picis liquidæ.
" plumbi carbonatis.
" " iodidi.
" potassii iodidi.
" stramonii.
" sulphuris.
" veratrinæ.
" zinci oxidi.

VINA (Wines).—The officinal solutions of medicines in wine are not numerous. Vinum album, vinum album fortius and vinum rubrum are the officinal wines; but vinum album fortius is employed as the menstruum for all the medicated wines. These are the following—

Vinum aloës, fʒj–iv.
" antimonii, ♏x–xxx.
" aromaticum, for external use.
" colchici radicis, ♏x–fʒj.
" colchici seminis, ♏xxx–fʒij.

Vinum ergotæ, fʒj–iv.
" ferri amarum. fʒij–iv.
" ferri citratis, fʒj.
" ipecacuanhæ, emetic, f℥j; expectorant, ♏x–xxx.
" opii, ♏xv–xx.
" rhei, fʒj–iv.

HINTS AS TO PRESCRIBING—HOW AND WHAT TO PRESCRIBE.

INCOMPATIBLES,

OR

REMEDIES THAT SHOULD NOT BE PRESCRIBED IN COMBINATION.

So many chemical remedies are employed by the practitioner, that it is well for him to consider whether his original intention may not be defeated by improper combination of two or more of this class of agents. As has been remarked by M. Mialhe,[1] it should be remembered that, when we administer several remedies at the same time, one of three things will happen: either each of the medicines will act in its own proper manner, as if it had been administered alone, or one of the substances will augment the action of the other, or the associated bodies will diminish or even annihilate each other's action. Sometimes two incompatibles are prescribed in combination intentionally, so that by mutual decomposition a new compound may be formed. In order to facilitate the prescriber in combining medicines understandingly, the following list of the principal chemical incompatibles is given, for reference merely, being rendered more convenient from its alphabetical arrangement. Careful study of its provisions will at once indicate that it is based on general principles, many of which would suggest themselves to the practitioner without any such elaborate guide to his action.

Some substances are *physiologically* incompatible, as belladonna and calabar bean: others are *pharmaceutically*

[1] Chemie Appliquée a la Physiologie et a la Thérapeutique, Paris, 1856.

so, as compound infusion of cinchona with compound infusion of gentian, or the latter with infusion of wild cherry; infusions generally with metallic salts; tinctures made with strong alcohol, with those made with weak alcohol, and with infusions and aqueous fluids; essential oils with aqueous liquids in quantities exceeding one drop to f℥j; fixed oils and copaiva with water or aqueous fluids, other than excipients.[1]

As a rule, the following remedies should be prescribed alone, and in simple solution:—

Acidum hydrocyanicum dilutum.
" nitromuriaticum dilutum.
Antimonii et potassii tartras.
Liquor calcis.
" potassæ.
" potassii arsenitis.
" ferri pernitratis.
Tinctura ferri chloridi.
" iodinii.

Potassii bromidum.
" iodidum.
" permanganas.
" acetas.
Zinci acetas.
Morphiæ acetas.
" murias.
Quiniæ sulphas.

List of Incompatibles.[2]

Absinthium. — Antimony and potassium, tartrate of. Iron, sulphate of. Lead, acetate of. Silver, nitrate of. Zinc, sulphate of.

Acacia.—Acids. Alcohol. Ammonia. Ether. Iron, tincture of chloride of. Lead, acetate of. Sodium, borate of. (In emulsion.) Acids. Mercury, corrosive chloride of. Oxymel. Syrup of squills. Potassium, tartrate and bitartrate of. All spirits. All tinctures.

Acidum aceticum.—Alkalies. Earths. Carbonates of alkalies and earths.

Acidum arseniosum.—Bark, decoction of. Copper, sulphate of. Iron, hydrated peroxide of. Lime-water. Magnesia. Silver, nitrate of. Potassium, iodide and sulphydrate of. Sulphurets, alkaline and earthy. Vegetable astringent infusions and decoctions.

Acidum citricum. — Acetates, alkaline and metallic. Acid, nitric. Acid, sulphuric. Carbonates, alkaline, earthy, and metallic. Potassium, tartrate of. Sulphurets, alkaline and earthy. Soaps.

W. Handsel Griffiths, Lessons on Prescriptions, etc. 12mo. London, 1876, p. 27.

[2] This table is based on that published in Dunglison's Therapeutics and Materia Medica, ii. 475, Phila. 1857, with numerous additions.

Acidum gallicum.—Antimony and potassium, tartrate of. Carbonates, alkaline. Copper, salts of. Iron, iodide and sulphate of. Lead, acetate of. Lime-water. Opium in solution. Silver, nitrate of.

Acidum hydrocyanicum. — Acids, mineral. Antimony, oxides of. Chlorine. Iron, salts of. Mercury, oxides of. Oxides generally. Silver, nitrate of. Sulphurets.

Acidum muriaticum.—Alkalies. Carbonates. Earths. Lead, salts of. Mercury, salts of. Oxides. Potassium, sulphate and tartrate of. Silver, salts of.

Acidum nitricum.—Alcohol. Alkalies. Carbonates. Earths. Iron, sulphate of. Lead, acetate of. Oils, essential. Oxides. Potassium, acetate of. Sulphurets. Zinc, sulphate of.

Acidum nitromuriaticum.—Alkalies. Earths. Oxides. Sulphurets.

Acidum oxalicum. Lime, salts of.

Acidum phosphoricum.—Barium, soluble salts of. Calcium, soluble salts of. Lead, soluble salts of.

Acidum sulphuricum. — Alcohol. Alkalies. Barium, chloride of. Calcium, chloride of. Carbonates. Chlorohydrates. Earths. Nitrates. Oils, essential. Organic substances. Oxides. Sulphydrates. Sulphurets. Vegetable astringent infusions.

Acidum tannicum.—Albumen. Alkalies. Antimony and potassium, tartrate of. Earths, alkaline. Carbonates. Ferric salts. Gelatin. Lead, acetate of. Vegetable alkaloids.

Acidum tartaricum.—Alkalies. Carbonates, alkaline and earthy. Earths. Lead, salts of. Lime. salts of. Lime-water. Mercury, salts of. Potassium, salts of. Vegetable astringents.

Adeps.—Alcoholic preparations. Decoctions. Infusions. Tinctures.

Aloe.—Mercury, nitrate of. Silver, nitrate of. Tin, protochloride of.

Alumen.—Alkalies. Alkaline salts. Ammonium, carbonate and chloride of. Galla. Kino. Lead, acetate of. Lime. Magnesia. Magnesium, carbonate of. Mercury, salts of. Potassium, carbonate of. Sodium, carbonate of.

Ammonii carbonas.—Acids. Alkalies, fixed. Alum. Carbonates, alkaline. Iron, salts of, except the potassio-tartrate. Lead, salts of. Lime. Lime, chloride of. Liquor potassæ. Magnesia. Magnesium, sulphate of. Mercury, acetate, chloride, and bichloride of. Potassa. Potassium, bitartrate and bisulphate of. Salts, acidulous. Sulphur. Zinc, sulphate of.

Ammonii chloridum.—Acid, nitric. Acid, sulphuric. Alkalies, fixed. Carbonates, alkaline. Iron, sulphate of. Lead, salts of. Lime. Liquor potassæ. Magnesia. Magnesium, sulphate of. Potassa. Potassium, carbonate of. Salts, metallic. Silver, salts of. Soda. Sodium, carbonate of. Zinc, sulphate of.

Amylum.—Iodine and its preparations.

Angustura.—Acids, mineral. Antimony and potassium, tartrate of. Cinchona, infusion of. Copper, sulphate of. Galls, infusion of. Iron, sulphate of. Lead, acetate of. Mercury, corrosive chloride of. Potassa. Silver, nitrate of. (In infusion.) Catechu, infusion of. Galls, infusion of. Zinc, sulphate of.

Anthemis.—Cinchona, infusion of. Gelatin. Iron, preparations of. Isinglass, solution of. Lead, salts of. Mercury, corrosive chloride of. Silver, nitrate of.

Antimonii et potassii tartras.—Acids, mineral. Alkalies. Calcium, chloride of. Carbonates, alkaline and earthy. Decoctions, bitter. Earths. Infusions, bitter. Lead, salts of. Lime-water. Metals. Soaps. Sulphydrates. Sulphurets.

Antimonii sulphuretum.—Acid, nitric. Acid, nitromuriatic.

Aqua ammoniæ.—Acids. Alum. Salts, metallic.

Argenti nitras.—Acetates. Acid, arsenious. Acid, muriatic, and salts. Acid, sulphuric, and salts. Acid, tartaric, and salts. Alkalies, fixed. Bromides. Chlorides. Copper, solutions of salts of. Earths, alkaline. Iodides. Lime. Phosphates. Sulphydrates. Soaps. Sulphurets. Vegetable astringent infusions. Water, common.

Armoracia.—Carbonates, alkaline. Cinchona, infusion of. Galls, infusion of. Mercury, corrosive chloride of. Silver, nitrate of. Vegetable astringents.

Arnica.—Acids, mineral. Iron, sulphate of. Lead, acetate of. Zinc, sulphate of.

Aurantii cortex.—Cinchona, infusion of. Iron, sulphate of. Lead, acetate of. Lime-water.

Auri chloridum.—Alkalies. Vegetable juices.

Balsama (copaiva, tolu, etc.).—Acids. Alkalies.

Barii chloridum.—Carbonates. Nitrates. Phosphates. Sulphates.

Belladonna.—Acid, tannic. Vegetable astringents.

Benzoinum.—Acids. Alkalies.

Buchu.—Galls, infusion of. Iron, sulphate of.

Calcii carbonas.—Acids. Alum. Ammonium, chloride of. Salts, acidulous.

Calumba.—Acids, mineral. Ammonia. Galls, infusion of. Iron, chloride of. Lead, acetate of. Lime-water. (In infusion.) Antimony and potassium, tartrate of. Cinchona, infusion of. Mercury, corrosive chloride of. Silver, nitrate of.

Calx chlorinata.—Acid, nitric. Acid, sulphuric. Alkalies, fixed. Carbonates, alkaline. Sodium, borate of. Sulphates.

Capsicum.—Alum. Ammonia. Carbonates, alkaline. Copper, sulphate of. Galls, infusion of. Iron, sulphate of. Lead, acetate of. Mercury, corrosive chloride, and nitrate of. Potassium, carbonate of. Silver, nitrate of. Zinc, sulphate of.

Cardamomum.—Acids. Iron, sulphate of. Mercury, corrosive chloride of.

Caryophyllus.—Cinchona. Antimony and potassium, tartrate of. Iron, sulphate of. Lead, acetate of. Lime-water. Silver, nitrate of. Zinc, sulphate of.

Cascarilla.—Same as the preceding.

Catechu.—Acid, muriatic. Acid, sulphydric. Albumen. Alkalies. Baryta, solutions of. Calcium, salts of. Gelatin. Lime-water. Salts, alkaline and metallic. (Also in infusion.) Acids, mineral.

Antimony and potassium, tartrate of. Cinchona, infusion of. Iron, sulphate of. Isinglass solution. Mercury, corrosive chloride of. Zinc, sulphate of.

Chloral hydrate.—Alkalies.

Cinchona.—Acids, mineral. Alkalies. Antimony and potassium, tartrate of. Carbonates, alkaline. Iron, sulphate of. Lead, acetate of. Lime-water. Magnesia. Mercury, corrosive chloride of. Rhubarb, infusion of. Silver, nitrate of. Vegetable bitters, infusion of. Zinc, sulphate of.

Coccus.—Iron, sulphate of. Lead, acetate of. Zinc, sulphate of.

Colchicum.—Acids.

Colocynthis.—Alkalies, fixed. Iron, sulphate of. Lead, acetate of Lime-water. Mercury, corrosive chloride of. Silver, nitrate of.

Conium.—Acid, tannic. Alkalies. Vegetable acids.

Copaiva.—Acids, mineral.

Creta præparata.—Acids. Alum. Ammonium, chloride of. Salts, acidulous.

Cupri sulphas.—Alkalies. Ammonium, acetate of. Calcium, chloride of. Carbonates, alkaline and earthy. Iron, acetate of. Lead, acetate of. Lime-water. Mercury, corrosive chloride of. Potassium, arsenite and tartrate of. Silver, nitrate of. Sodium, borate of. Vegetable astringent infusions, and tinctures.

Cuprum ammoniatum.—Acids. Alkalies, fixed. Lime-water.

Digitalis.—Acid, tannic. Cinchona, infusion of. Iron, sulphate of. Lead, acetate of. Vegetable astringents.

Ferri chloridum.—Alkalies. Carbonates, alkaline. Calcium, carbonate of. Gum, solutions of. Lime-water. Magnesium, carbonate of. Vegetable astringents.

Ferri iodidum.—Alkalies, fixed. Lime-water. Vegetable astringents.

Ferri et potassii tartras.—Acids. Lime-water. Potassium, sulphydrate of. Sulphur. Vegetable astringent infusions.

Ferri subcarbonas.—Acids and their salts.

Ferri sulphas.—Acid, nitric. Alkalies. Ammonium, acetate of. Ammonium, chloride of. Barium, chloride of. Calcium, chloride of. Carbonates, alkaline. Earths. Lead, acetate of. Lime-water. Potassium, iodide and nitrate of. Potassium and sodium, tartrate of. Salts, with base forming insoluble sulphates. Silver, nitrate of. Soap. Sodium, borate of. Tannic acid. Vegetable alkaloids. Vegetable astringent infusions.

Ferrum ammoniatum.—Acids. Alkalies. Carbonates, alkaline. Lime-water. Vegetable astringents.

Galla.—Acid, muriatic. Acid, sulphuric. Alkalies. Antimony and potassium, tartrate of. Bismuth, salts of. Carbonates, alkaline. Cinchona, infusion of. Copper, sulphate of. Gelatin. Iron, salts of. Isinglass, solution of. Lead, salts of. Lime-water. Mercury, corrosive chloride of. Mercury, nitrate of. Opium, solution of. Salts, generally. Silver, nitrate of. Zinc, salts of. Vegetable alkaloids.

Guaiacum.—Acids, mineral. Chlorine, solution of. Salts, earthy and metallic. Spirit of nitrous ether.

Gentiana.—Iron, sulphate of. Lead, acetate of.

Hæmatoxylon.—Acid, acetic. Acids, mineral. Alum. Antimony and potassium, tartrate of. Cinchona, infusion of. Copper, sulphate of. Iron, sulphate of. Lead, acetate of. Opium.

Humulus.—Acids, mineral. Iron, salts of. Lead, salts of. Mercury, salts of. Silver, salts of.

Hydrargyri chloridum corrosivum.—Albumen. Alkalies, fixed. Almond mixture. Ammonia. Antimony and potassium, tartrate of. Bismuth. Calcium, carbonate of. Carbonates, alkaline. Copper, salts of. Gelatin. Gluten. Hydrosulphates. Infusions of chamomile, cinchona, columbo, horseradish, oak bark, senna, simaruba, and tea. Iron, salts of. Lead, salts of. Lime-water. Mercury. Milk. Oils. Potassium, bromide and iodide of. Potassium, sulphate and sulphuret of. Sarsaparilla. Silver, nitrate of. Soap. Sodium, bromide, iodide, and sulphate of. Sulphur. Sulphurets. Vegetable astringents. Zinc, salts of.

Hydrargyri chloridum mite.—Acids, mineral. Alkalies. Antimony, golden sulphuret of. Carbonates, alkaline. Chlorides. Chlorine. Copper, salts of. Iron, salts of. Lead, salts of. Lime-water. Potassium, iodide and sulphuret of. Soaps.

Hydrargyri iodidum.—Acids, mineral. Iodides. Potassium, chloride of. Sodium, chloride of.

Hydrargyri oxidum rubrum.—Acids.

Hydrargyri oxidum nigrum.—Acids.

Hydrargyrum ammoniatum.—Acids. Alkalies, fixed. Tin, protochloride of.

Hydrargyrum cum cretâ.—Acids and their salts. Alum.

Hydrogen, peroxide of. Acid, hydrocyanic. Alkalies, citrates and tartrates of. Chlorides. Iron, salts of. Nitrates. Tartrates. Vegetable tinctures.

Hyoscyamus.—Acids, vegetable. Iron, sulphate of. Lead, acetate of. Silver, nitrate of. Vegetable astringents.

Infusum lini.—Alcohol. Lead, acetate of.

Iodinium.—Alkalies. Earths, alkaline. Starch.

Ipecacuanha.—Acids, vegetable. Lead, acetate of. Vegetable astringents.

Kino.—Same as Galla.

Krameria.—Same as Galla.

Lavandula —Iron, sulphate of.

Limonis cortex.—Acid, nitric. Acid, oxalic. Acid, sulphuric. Acid, tartaric. Lime-water.

Liquor ammonii acetatis.—Acids. Alkalies. Alum. Copper, sulphate of. Iron, sulphate of. Lime-water. Lead, acetate of. Magnesium, sulphate of. Mercury, corrosive chloride of. Silver, nitrate of. Zinc, sulphate of.

Liquor arsenici et hydrargyri iodidi. Morphia, acetate, muriate, and sulphate of. Opium, tincture of.

Liquor calcis.—Acids. Ammonium, chloride of. Alum. Borates. Carbonates, alkaline. Citrates. Iron, sulphate of. Magnesium, sulphate of. Mercury, chlorides of. Salts, alkaline and metallic. Silver, nitrate of. Soap. Sulphur. Tartrates. Tinctures. Vegetable astringent infusions. Zinc, sulphate of.

Liquor plumbi subacetatis.—Alkalies. Carbonates, alkaline. Mucilages. Soap liniment. Sulphates, alkaline. Sulphurets of alkaline metals. Water, undistilled.

Liquor potassæ.—Acids. Ammonium, acetate, carbonate, and chloride of. Mercury, chlorides of. Salts, metallic.

Liquor potassii arsenitis.—Acids, mineral. Alum. Calcium, salts of. Cinchona, infusion of. Copper, salts of. Hydrosulphates. Iron, salts of. Lime-water. Magnesium, sulphate of. Salts, acidulous. Silver, nitrate of. Sulphurets. Vegetable astringents

Lupulina.—Iron. Mercury, salts of. Platinum, salts of. Tin, salts of.

Magnesia.—Acids. Ammonium, chloride of. Salts, acidulous and metallic.

Magnesii carbonas.—Acids. Alkalies. Alum. Ammonium, chloride of. Copper, sulphate of. Iron, sulphate of. Lead, acetate of. Lime-water. Mercury, acetate and corrosive chloride of. Potassium, bitartrate of. Salts, acidulous and neutral. Silver, nitrate of. Zinc, sulphate of.

Magnesii sulphas.—Alkalies. Ammonium, chloride of. Barium, chloride of. Calcium, chloride of. Carbonates, alkaline. Lead, acetate of. Lime-water. Silver, nitrate of.

Mentha.—Iron, sulphate of. Lead, acetate of. Silver, nitrate of.

Morphia.—Oxides, metallic.

Morphia, salts of.—Alkalies. Ammonia. Carbonates, alkaline. Decoctions and infusions of vegetable astringents. Lead, acetate of. Lime. Magnesia. Silver, nitrate of.

Moschus.—Acids, mineral. Cinchona, infusion of. Iron, sulphate of. Mercury, corrosive chloride of. Silver, nitrate of.

Mucilago.—Alcohol. Ammonia. Acids, strong. Ether, compound spirit of. Iron, tincture of chloride of. Salts, metallic.

Opium.—Alkalies. Carbonates, alkaline. Catechu. Cinchona. Copper, salts of. Galls. Iron, salts of. Kino. Lead, acetate of. Lime-water. Mercury, corrosive chloride of. (In infusion, etc.) Ammonia. Carbonates, alkaline. Copper, sulphate of. Galls, infusion of. Iron, sulphate of. Lead, acetate of. Mercury, corrosive chloride of. Silver, nitrate of. Zinc, sulphate of.

Oleum amygdalæ.—Acids. Mercury, corrosive chloride of.

Oxymel.—Poppies, syrup of. Potassium, bisulphate, bitratrate, and tartrate of. Resins. Squills, syrup of. Water, hard.

Pimenta.—Alum. Ammonia. Carbonates, alkaline. Cinchona, infusion of. Copper, salts of. Iron, nitrate and sulphate of. Silver, salts of. Zinc, salts of. Vegetable astringents.

Piper.—Galls, infusion of.

Plumbi acetas.—Acids. Alkalies. Alum. Ammonium, solution of acetate of. Antimony and potassium, tartrate of. Carbonates, alkaline. Chlorides. Earths. Chlorohydrates. Iron, ammoniated. Iron and potassium, tartrate of. Lime-water. Milk. Opium, infusion of. Soaps. Sodium, borate of. Sulphates. Sulphurets. Tartrates. Vegetable astringents. Water, common.

Potassa.—Acids. Ammonium, salts of. Salts, acidulous, earthy, and metallic.

Potassii acetas.—Fruits, acid. Acids, mineral. Ammonium, chloride of. Calcium, carbonate of. Magnesium, sulphate of. Mercury, corrosive chloride of. Potassium, tartrate of. Salts, acid, alkaline, and metallic, except acetates. Sodium, sulphate of. Tamarinds.

Potassii bicarbonas.—Acids. Alum. Ammonium, salts of. Antimony and potassium, tartrate of. Calcium, carbonate and chloride of. Copper, acetate and sulphate of. Iron, chloride and sulphate of. Iron and potassium, tartrate of. Lead, acetate of. Lime-water. Magnesium, sulphate of. Mercury, corrosive chloride of. Mercury, mild chloride of. Salts, acidulous and metallic. Silver, nitrate of. Sodium, borate of. Zinc, sulphate of.

Potassii bitartras.—Acids, mineral. Alkalies. Earths, alkaline. Lime-water.

Potassii bromidum.—Lead, salts of. Mercury, salts of. Salts, acid and acidulous, except bitartrate of potassium. Silver, salts of.

Potassii carbonas.—See Potassii bicarbonas.

Potassii citras.—Acids, mineral. Calcium, salts of. Lead, salts of. Silver, salts of.

Potassii iodidum.—Acids. Lead, acetate of. Mercury, corrosive chloride of. Salts, acidulous, except bitartrate of potassium. Salts, metallic.

Potassii nitras.—Acid, sulphuric. Acid, tartaric. Alum. Salts, metallic.

Potassii sulphas.—Acid, muriatic. Acid, nitric. Acid, tartaric. Calcium, compounds of. Lead, salts of. Mercury, salts of. Silver, nitrate of.

Potassii sulphuretum.—Acids. Salts, acidulous. Earths, metallic.

Potassii tartras.—Acids. Acid fruits. Ammonium, chloride of. Barium, chloride of. Calcium, chloride of. Lead, acetate of. Lime. Magnesia. Magnesium, sulphate of. Potassium, sulphate of. Salts, acidulous. Silver, nitrate of. Sodium, sulphate of. Tamarinds. Vegetables, acid.

Quassia.—Lead, acetate of. Silver, nitrate of.

Quercus.—Alkalies. Carbonates, alkaline. Cinchona, infusion of. Iron, salts of. Isinglass, solution of. Lead, acetates of. Lime-water. Mercury, corrosive chloride of. Zinc, sulphate of.

Quiniæ sulphas.—Alkalies. Astringent solutions. Carbonates, alkaline. Earths, alkaline. Infusion of galls, and of orange-peel, compound. Infusion of roses. Lead, salts of. Lime-water. Potassium, tartrate of. Silver, nitrate of. Tincture of cinchona.

Rheum.—Acids, mineral. Antimony and potassium, tartrate of. Infusions of angustura, catechu, cinchona, or galls. Iron, sulphate of. Isinglass. Lead, acetate of. Lime-water. Mercury, corrosive chloride of. Silver, nitrate of. Zinc, sulphate of.

Rosa gallica.—Alkalies. Earths. Gelatin. Iron, sulphate of. Lime-water. Zinc, sulphate of.

Salix.—Carbonates, alkaline. Gelatin. Iron, sulphate of. Isinglass solution. Lime-water. Zinc, sulphate of.

Salvia.—Iron, salts of.

Sapo.—Acids. Alum. Antimony and potassium, tartrate of. Calcium. chloride and sulphate of. Copper, ammoniated. Copper, sulphate of. Earths. Iron, ammoniated. Iron and potassium, tartrate of. Iron, sulphate of. Lead, acetate of. Lime-water. Magnesium, sulphate of. Mercury, acetate, corrosive chlor de, and mild chloride of. Salts, acidulous and metallic Silver, nitrate of. Vegetable astringent infusions. Water, hard. Zinc, sulphate of.

Sarsaparilla.—Galls, infusion of. Lead, acetate of. Lime-water. Mercury, nitrate of.

Scammonium.—Acids.

Scilla.—Carbonates, alkaline. Gelatin. Lead, acetate of. Lime-water. Silver, nitrate of.

Senna.—Acids, mineral. Antimony and potassium, tartrate of. Carbonates, alkaline. Cinchona, infusion of. Lead, acetate of. Lime-water. Mercury, corrosive chloride of. Silver, nitrate of.

Serpentaria. (In infusion.)—Acids, mineral. Alkaline carbonates. Antimony and potassium, tartrate of. Cinchona, infusion of. Lead, acetate of. Lime-water. Mercury, corrosive chloride of. Silver, nitrate of.

Sodii acetas.—Acids, mineral. Calcium, carbonate of.

Sodii bicarbonas. See Potassii bicarbonas.

Sodii boras.—Acids. Ammonium, chloride and sulphate of. Chlorohydrates, earthy. Potassa. Sulphates, earthy.

Sodii carbonas.—See Potassii carbonas.

Sodii phosphas.—Acids, mineral. Alum. Calcium, carbonate of. Salts, with earthy base.

Sodii et potassii tartras.—Acids. Ammonium, chloride of. Barium, salts of. Calcium, salts of. Lead, salts of. Magnesium, sulphate of. Potassium, sulphate of. Salts, acidulous, except bitartrate of potassium. Silver, nitrate of. Soda, sulphate of. Tamarinds.

Sodii sulphas.—Acid, muriatic. Acid, nitric. Acid, sulphuric. Barium, chloride of. Lead, salts of. Lime. Magnesia. Potassium, acetate and carbonate of. Silver, salts of.

Spiritus ætheris nitrosi.—Carbonates, alkaline and earthy. Guaiacum, tincture of. Iron, sulphate of.

Spiritus ammoniæ aromaticus.—Acids. Lime-water. Salts, earthy and metallic. Salts, with excess of acids.

Stramonium.—Acids, mineral. Iron, salts of. Lead, salts of. Mercury, salts of. Silver, salts of.

Tamarindus.—Antimony and potassium, tartrate of. Carbonates, alkaline. Lime-water. Potassium, salts of. Senna, infusion of. Sodium, salts of.

Taraxacum.—Galls, infusion of. Iron, sulphates of. Lead, acetate of. Mercury, corrosive chloride of. Silver, nitrate of.

Tinctura ferri chloridi.—Alkalies. Astringents. Carbonates, alkaline. Lime-water. Magnesia. Mucilage. Vegetable astringent infusions.

Tinctura opii.—Ammonia, solution of. Potassa and carbonates. Salts, metallic. Soda and carbonates. Vegetable astringent infusions and decoctions.

Tragacantha.—Alcohol. Copper, sulphate of. Iron, sulphate of. Lead, acetate of.

Uva ursi.—Alkalies. Antimony and potassium, tartrate of. Gelatin. Infusion of cinchona. Ipecacuanha. Iron, salts of. Lead, salts of. Opium. Silver, nitrate of.

Valeriana.—Cinchona, infusion of. Iron, salts of. Silver, nitrate of.

Zinci oxidum.—Acids. Alkalies. Salts, acidulous.

Zinci sulphas.—Alkalies. Carbonates, alkaline. Earths. Lime-water. Milk. Sulphydrates. Sulphurets. Mucilage. Vegetable astringent infusions.

WHAT TO PRESCRIBE IN THE SOLID OR THE LIQUID FORM.

As the practitioner is frequently at a loss to know in what shape he can place the remedy or remedies he wishes to give his patient, that they may be at once unobjectionable and effective, it is desirable that he should have rules to guide him. In rural districts this becomes especially necessary, as the physician is so often his own apothecary, mixing and dispensing medicines, and preparing them for use in his practice, often according to his own unassisted taste or knowledge.

Medicines Adapted to the Liquid Form.[1]

Under this head may be mentioned most of the soluble salts, light insoluble powders, extracts, gum resins, fixed and essential oils, and all the galenical solutions.

Soluble Substances.

Forming Eligible Solutions with Water.

Acidum citricum.
" tannicum.
" tartaricum.
Alumen.
Ammonii chloridum.
Antimonii et potassii tartras.
Barii chloridum.
Calcii chloridum.
" hypophosphis.
Ferri sulphas.
" et potassii tartras.
" pyrophosphas.
Magnesii sulphas.
Manganesii sulphas.
Morphiæ acetas.
" murias.
" sulphas.

Potassii acetas.
" bicarbonas.
" bromidum.
" carbonas.
" citras.
" chloras.
" hypophosphis.
" iodidum.
" tartras.
Sodii bicarbonas.
" boras.
" carbonas.
" chloridum.
" hypophosphis.
" phosphas.
" sulphas.
" et potassii tartras.

Requiring certain Additions to Form Eligible Solutions.

Chinoidine.
Cinchoniæ sulphas.
Hydrargyri iodidum rubrum.
Iodinium.
Quiniæ sulphas.
Quinidiæ sulphas.

Requiring Viscid Substances as Correctives or Vehicles.

Ammonii carbonas.
Hydrargyri chloridum corrosivum.
Plumbi acetas.
Potassii cyanuretum.
Potassa.

Best formed into Solutions in making the Chemical Compounds.

Acidum phosphoricum.
Ammonii acetas.
Arsenici et hydrargyri iodidum.
Ferri citras.
" nitras.

Ferri phosphas.
Magnesii citras.
Potassa.
Potassii arsenis.
" bitartras.

[1] From tables in Parrish's Pharmacy, Phila., 1874, pp. 802 and 829.

Insoluble Substances.

Mixing with Water, but not Forming Clear Solutions.

Diffused by Agitation.

Calcii phosphas.
Magnesia.
Potassii bitartras.
Pulvis cinchonæ.
" ipecacuanhæ.
Quiniæ sulphas.
Sulphur præcipitatum.

Miscible by Trituration alone.

Ammoniacum.
Assafœtida.
Extractum aconiti.
" belladonnæ.
" conii.
" glycyrrhizæ.
" hyoscyami.
" krameriæ.
" stramonii.
" taraxaci.

Confectiones.
Guaiacum.
Myrrha.
Scammonium.

Suspended by the Aid of Viscid Excipients.

Copaiba.
Ferri protocarbonas.
Olea destillata.
Oleum amygdalæ.
" olivæ.
" ricini.

Best Combined with a Fixed Oil or Yelk of Egg.

Camphora.
Chloroformum.
Extractum cannabis Indicæ.
Oleum terebinthinæ.

Medicines Adapted to the Form of Powder.

The substances best adapted to this form are insoluble mineral substances, vegetable products, and some soluble substances, all of which are included in the following syllabus:—

Insoluble Substances; too Large Doses for Pills.

Calcii phosphas.
Carbo ligni.
Creta præparata.
Ferri subcarbonas.
" phosphas.
Magnesia.
Potassii bitartras.
Sulphur sublimatum (and others).
Vegetable powders, as cinchona, calomba, cubebs, gentian, jalap, rhubarb (and others).

In Certain Combinations, and when Pills are Objected to.

Bismuthi subnitras.
Calomel.
Cinchona alkaloids.
Opium alkaloids.
Powdered acidum gallicum.
" " tannicum.
" digitalis.
Powdered extractum colocynthidis compositum.
" kino.
" nux vomica.
" opium.
" pilula hydrargyri.
" potassii nitras (and many others).

The *Diluents for substances prescribed in the form of powders* are—

Aromatic powder.
Lactin.
Mannite.
Powdered acacia.
" cinnamon.
Powdered elm bark.
" extract of liquorice.
" sugar.
" tragacantha (and others).

Medicines Adapted to the Pilular Form.

These include powders given in less than gr. xv doses, gum resins, extracts, also oleoresins and oils in small proportion.

UNADHESIVE MATERIALS.

Antimonii et potassii tartras.
" sulphuretum.
Argenti nitras.
" oxidum.
Bismuthi subnitras.
Calomel.
Camphor.
Ferri pulvis.
" subcarbonas (and other salts).
Morphiæ acetas, etc.
Plumbi acetas.
Potassii iodidum.
Pulvis digitalis.
" ipecacuanhæ.
" " et opii.
Strychnia (and others).

Difficult to Combine, Except by Peculiar Treatment.

Copaiba.
Ferri iodidum.
Oleum terebinthinæ.
" tiglii (and others).

GOOD MEDICINAL EXCIPIENT.

Extracts.
Pilula ferri carbonatis.
Pilulæ copaibæ.
" hydrargyri.
Terebinthina.

With Moisture.

Assafœtida.
Bebeerinæ sulphas.
Ferri citras.
Pulv. acidi tannici.
" aloës.
" kino.
Pulv. opii.
" rhei.
" scillæ (and others).

With Alcohol and Tinctures.

Guaiacum.
Resinous extracts (and others).

With Dilute Sulphuric Acid.

Cinchoniæ sulphas.
Quiniæ sulphas.
Quinidiæ sulphas.
Quinoidina.

THE MODERN TREATMENT OF DISEASES.

A list of the principal remedial agents, arranged in conjunction with the diseases to which they are applicable, will supply to the practitioner a means of ready reference and useful therapeutic suggestions.[1] No attempt will be made to indicate the doses, form of preparation, special adaptedness of the remedy, etc., and the reader must distinguish for himself those which must be used externally as washes, injections, atomized fluids, etc., and those which must be administered internally. Although such a commentary might be very desirable, its necessarily extended length would transcend all possible limits. Surgical treatment is not alluded to.

Abscess—
Alcohol.
Belladonna.
Calcium, phosphate [of.
Carbolic acid.
Chloral.
Counter-irritants.
Ether.
Iodine.
Oleate of mercury and morphia.
Poultices.
Sulphides.

Acidity of Stomach—
Acids.
Alkalies.
Ammonia, solution of.
Ammonium, carbonate of.
Argilla.
Bismuth, subnitrate [of.
Chalk, prepared.
Charcoal.
Fel bovinum.
Lime-water.
Magnesia and carbon- [ate.
Nux vomica.
Potassa, solution of.
Potassium, carbonates of.
Silver, oxide of.
Sodium, carbonates of.

Acne—
Acid, hydrocyanic.
Acids, mineral.
Arsenic.
Bath, vapor.
Benzoin.
Cod-liver oil.
Collodion.
Conium.
Corrosive sublimate.
Creasote.
Glycerine.
Green soap.
Hot water.
Iodine.
Iron.
Laxatives, saline.
Lead, acetate of.
Mercury, iodide and nitrate of.

[1] The doses of the various articles have already been mentioned (p. 94). Formulæ for the administration of many of these are given elsewhere (p. 181). For doses of gargles, injections, etc., see pages 118-139. Dietetic hints and precepts, applicable to diseases, will be considered hereafter.

Acne—*continued.*
Oil of cajeput.
Phosphorus.
Potassa.
Potassium, bromide and sulphide of.
Sulphur.
Sulphur, iodide of.
Tannic acid.

Addison's Disease.
Alcohol.
Bismuth.
Cod-liver oil.
Digitalis.
Electricity.
Iced drinks.
Iron.
Phosphorus.
Silver, nitrate of.

Adynamia—
Alcohol.
Cinchona.
Iron.
Malt liquors.
Phosphorus.
Tonics.
Wines.
(See Debility and Anæmia.)

Albuminuria—See Bright's disease.

Alopecia—
Ammonium, chloride of.
Cantharides.
Castor oil.
Copper, sulphate of.
Corrosive sublimate.
Glycerine.
Green soap.
Lotions (alcoholic, alkaline, etc.).
Oils.
Quinia.

Amaurosis—
Electricity.
Nux vomica.
Strychnia.
Veratrum.

Amenorrhœa—
Aconite.
Alcohol.
Alkalies.
Aloes.
Ammonia, solution of.
Ammonium, chloride of.
Apiol.
Arsenic.
Assafœtida.
Baths, hot.
Calcium, iodide of.
Calumbo.
Cantharides.
Castor.
Chloroform.
Cimicifuga.
Colocynth.
Crocus.
Electricity.
Emmenagogues.
Ergot.
Foot-bath.
Galbanum.
Gamboge.
Gentian.
Guaiacum.
Hellebore.
Ice-bag, spinal.
Iodine.
Iron.
Manganese.
Massage.
Mercury, iodide of.
Mustard bath.
Myrrh.
Oil of cajeput.
Oil of turpentine.
Potassium, bromide of.
Rhubarb.
Rosemary.
Rue.
Savine.
Silver, nitrate of.
Sponging, cold.
Strychnia.
Tansy.

Anæmia—
Acids.
Arsenic.
Calcium, hypophosphite and phosphate of.
Iron.
Manganese.
Oxygen.
Phosphorus.
Quinia.
Sodium, hypophosphite of.
Sponging, cold.
Zinc, phosphide of.
(See Adynamia and Chlorosis.)

Anæmia, Pernicious—See Pernicious.

Aneurism—
Alum.
Chloroform.
Collodion.
Compression.
Digitalis.
Electricity.
Ergot.
Iodine.
Iron.
Potassium, iodide of.
Zinc, chloride of.

Angina Pectoris—
Amyl, nitrite of.
Arsenic.
Assafœtida.
Chloral.
Digitalis.
Electricity.
Ether.
Fomentations.
Hydrocyanic acid.
Iodine.
Morphia
Musk.
Oil of turpentine.
Opium.
Phosphorus.
Potassium, chlorate of.
Silver, nitrate of.

Anthrax—See Carbuncle.

Aphonia—
Alum.
Arnica.
Cauterization.
Chlorine.
Croton oil.
Cubebs.
Electricity.
Ether.
Iodine.
Strychnia.

Aphthæ—
Alum.
Borax.
Chlorine water.
Creasote.
Iron, nitrate of.
Krameria.
Lead, acetate of.
Nitric acid.
Potassium, carbonate and chlorate of.
Rose, French.
Sage.
Sugar.
Tannic acid.
Zinc, sulphate of.

Apoplexy—
Assafœtida.
Bloodletting.
Blisters.
Colocynth.
Croton oil.
Elaterium.
Iodine.
Mustard.

Arterial Excitement—
Aconite.
Antimony.
Bloodletting.
Gelsemium.
Veratrum viride.

Arthritis—
Arsenic.
Cod-liver oil.
Iodine.
Mercury.
Morphia.
Opium.
(See Joints.)

Ascarides—
Acetic acid.
Aloes.
Assafœtida.
Camphor.
Carbolic acid.
Cod-liver oil.
Ether.
Lime-water.
Mucuna.
Quinia, sulphate of.
Santonin.
Senna.
Silver, nitrate of.
Sodium, chloride of.
Sugar.
Tansy.
Tin, powdered.
Tobacco.
(See Worms.)

Asthma—
Aconite.
Alum.
Ammonia.
Amyl, nitrite of.
Anæsthetics.
Arsenic.
Assafœtida.
Atropia.
Bath, Turkish.
Belladonna.
Benzoin.
Blisters.
Bromides.
Cannabis Indica.
Castor.
Chloral.
Chloroform.
Cinchona.
Coffee
Colchicum.
Conium.
Counter-irritants.
Creasote.
Croton oil.
Digitalis.
Dracontium.
Electricity.
Ether.
Eucalyptus.
Fomentations.

Asthma—*continued.*
Galbanum.
Hydrocyanic acid.
Hyoscyamus.
Iodine.
Ipecacuanha.
Jaborandi.
Lobelia.
Morphia.
Nitric acid.
Oil of turpentine.
Opium.
Oxygen.
Potassium, bromide, carbonate, cyanide, iodide, and nitrate of.
Quinia, sulphate of.
Silver, nitrate of.
Stramonium.
Strychnia.
Sulphurous acid.
Tartar emetic.
Tobacco.
Veratrum.

Atrophy, Muscular—
Blisters.
Brucia.
Cod-liver oil.
Nux vomica.
Sugar.
Strychnia.

Bed-sores.
Alcohol.
Alum.
Camphor.
Charcoal.
Collodion.
Creasote.
Galvanism.
Glycerine.
Iodoform.
Lead, carbonate, iodide, and tannate of.
Silver, nitrate of.
(See Sores.)

Bladder, Diseases of—
Ammonium, benzoate and chloride of.
Belladonna.
Benzoic acid.
Buchu.
Cantharides.
Copaiba.
Cubebs.
Ergot.
Flaxseed.
Gallic acid.
Iodine.
Iodoform.
Juniper.
Oil of turpentine.
Pareira.
Paullinia.
Salicylic acid.
Sodium, carbonate of.
Strychnia.
Sulphites.
Uva ursi
(See Cystitis, etc.)

Boils—
Acids, mineral.
Arsenic.
Belladonna.
Calcium, sulphide of.
Camphor.
Carbolic acid.
Cold.
Collodion.
Counter-irritants.
Glycerine.
Hyposulphites.
Iodine.
Iron.
Opium.
Poultices.
Quinia.
Silver, nitrate of.
Sulphites.

Breasts, Inflammation of—
Antiphlogistics.
Belladonna.
Opium.
(See Nipples.)

Bright's Disease—
Aconite.
Alkalies.
Ammonia, benzoate of.
Baths (Turkish, warm, etc.).
Blisters.
Cannabis Indica.
Cinchona.
Copaiba.
Diaphoretics.
Digitalis.
Diuretics.
Elaterium.
Gallic acid.
Iodine.
Iron, chloride of.
Jaborandi.
Lead, acetate of.
Potassium, bitartrate and iodide of.
Senega.
Sulphur.
Tannic acid.

Bronchitis—
Alum.
Ammoniac.
Ammonium, carbonate and chloride of.
Arsenic.
Assafœtida.
Balsam of Peru.
Balsam of tolu.
Baths.
Benzoic acid.
Benzoin.
Blisters.

Bronchitis—*continued.*

Burgundy pitch.
Calabar bean.
Calcium, iodide of.
Cantharides.
Carbolic acid.
Castor oil.
Cetraria.
Chloroform.
Chondrus.
Cimicifuga.
Cinchona.
Cod-liver oil.
Copaiba.
Copper, ammoniated.
Counter-irritants.
Cubebs.
Demulcents.
Digitalis.
Dulcamara.
Electricity.
Expectorants.
Flaxseed.
Gallic acid.
Garlic.
Hydrocyanic acid.
Inhalations.
Iodine.
Ipecacuanha.
Iron.
Jaborandi.
Lactucarium.
Lead, acetate of.
Liquorice.
Lobelia.
Mustard.
Nitric acid.
Nux vomica.
Oil of turpentine.
Opium.
Potassium, chlorate of.
Poultices.
Quinia.
Sanguinaria.
Senega.
Silver, nitrate of.
Squill.
Strychnia.
Sulphur.
Sulphurous acid.
Syrup.
Tannic acid.
Tar.
Tartar emetic.
Zinc, oxide and sulphate of.
Wild cherry.

Bronchocele—

Ammonium, iodide of.
Belladonna.
Cod-liver oil.
Iodine.
Iron, iodide of.
Mercury, deutiodide of.
Potassium, bromide and iodide of.

Bronchorrhœa—

Alum.
Ammoniac.
Astringents.
Creasote.
Digitalis.
Gallic acid.
Ice-bag, spinal.
Iodine.
Iron.

Bubo—

Carbolic acid.
Iodoform.
Iodine.
Nitric acid.
Salicylic acid.
Sulphides.

Burns—

Acetic acid, dilute.
Alum.
Bath, warm.
Bismuth, subnitrate of.
Carbolic acid.
Castor oil.
Chloral.
Cod-liver oil.
Cold.
Collodium.
Creasote.
Cotton.
Glycerine.
Iodine.
Iodoform.
Lead, acetate and carbonate of.
Lime, chlorinated.
Lime-water.
Lime-water and linseed oil.
Oil of turpentine.
Silver, nitrate of.
Soda, chlorinated.
Tannic acid.
Turpentine liniment.

Calculi—

Alkalies.
Belladonna.
Chloroform.
Counter-irritants.
Ether.
Muriatic acid, dilute.
Nitric acid, dilute.
Potassium, citrate of.
Uva ursi.
(See Lithiasis.)

Calculi, Biliary—

Bath (hot or vapor).
Belladonna.
Chloral.
Chloroform.
Ether.
Fomentations.
Morphia.
Opium.
Saline aperients.
Sodium, choleate of.

Cancer—
- Acetic acid.
- Arsenic.
- Belladonna.
- Carbolic acid.
- Carbonic acid.
- Charcoal.
- Chloral.
- Chloroform.
- Conium.
- Enemata.
- Iodine.
- Iodoform.
- Iron.
- Mercury.
- Nitric acid.
- Opium.
- Potassa.
- Poultices.
- Sanguinaria.
- Silver, nitrate of.
- Tannic acid.
- Zinc, chloride of.

Cancrum Oris—
- Acetic acid.
- Ammonium, carbonate of.
- Chlorine.
- Copper, sulphate of.
- Lime, chlorinated.
- Nitric acid.
- Potassium, chlorate of.
- Zinc, sulphate of.

Carbuncle—
- Belladonna.
- Carbolic acid.
- Collodion.
- Creasote.
- Iodine.
- Iron.
- Opium.
- Poultices.
- Pressure.
- Quinia.
- Sulphides

Caries—
- Cod-liver oil.
- Creasote.
- Nitric acid.
- Potassium, permanganate of.
- Sulphuric acid.
- Tonics.

Cataract—
- Atropia.
- Belladonna.
- Phosphorus.

Catarrh—
- Aconite.
- Actæa racemosa.
- Almond oil.
- Ammoniac.
- Ammonium, chloride of.
- Antimony.
- Assafœtida.
- Balm.
- Bath (Turkish, warm foot-bath).
- Carbolic acid spray.
- Dover's powder.
- Eucalyptus.
- Garlic.
- Ipecacuanha.
- Oil of turpentine.
- Olive oil.
- Opium.
- Potassium, chlorate of.
- Squill.
- Tannic acid.
- Tar.
- Tolu.
- Zinc, oxide of.

Cerebral Excitement—
- Bloodletting.
- Cathartics.
- Cold.
- Cold douche.
- Counter-irritants.
- Potassium, bromide of.
- (See Meningitis, Delirium, Mania, etc.)

Chancre—
- Alkalies.
- Caustics.
- Corrosive sublimate.
- Escharotics.
- Hydrogen, peroxide of.
- Iodoform.
- Mercury, nitrate of.
- Nitric acid.
- Salicylic acid.
- Silver, nitrate of.
- Zinc, chloride of.
- (See Syphilis.)

Chaps—
- Benzoin.
- Collodion.
- Glycerine.
- Glycerite of starch.
- Lead, nitrate of.
- Sulphurous acid.
- (See Sores.)

Chilblains—

Alum.
Balsam of Peru.
Borax.
Capsicum.
Copaiba.
Iodine.
Iron.
Nitric acid.
Oil of turpentine.
Petroleum.
Sulphurous acid.
(See Frostbite.)

Chloasma—

Bismuth, subnitrate of.
Corrosive sublimate.
Mercury (ammoniated and nitrate).
Soap, potash.
Zinc, sulphate of.

Chlorosis—

Arsenic.
Calcium, hypophosphite of.
Cinchona.
Cold.
Electricity.
Iron.
Mercury.
Nux vomica.
Oxygen.
Phosphorus.
Sodium, hypophosphite of.
Tonics.
Zinc, phosphide of.
(See Anæmia.)

Cholera and Cholera Morbus—

Acid, nitric.
Amyl, nitrite of.
Arsenic.
Calomel.
Camphor.
Capsicum.
Chloral.
Chloroform.
Copper.
Counter-irritants.
Creasote.
Ice-bag, spinal.
Indian hemp.
Hot-air bath.
Lead, acetate of.
Lime.
Mercury with chalk.
Mustard.
Nux vomica.
Opiates.
Potassium, chlorate of.
Silver, nitrate of.
Sodium, chloride of.
Strychnia.
Sulphuric acid.
Tannic acid.

Cholera Infantum—

Alum.
Cold baths.
Enemata.
Ipecacuanha.
Lead, acetate of.
Opium.
Potassium, chlorate of.
Sulphuric acid.
(See Diarrhœa.)

Chordee—

Aconite.
Belladonna.
Bromides.
Camphor.
Camphor, monobromated.
Lupulin.

Chorea—

Actæa racemosa.
Arsenic.
Assafœtida.
Belladonna.
Bromides.
Calabar bean.
Camphor, monobromated.
Chloral
Chloroform.
Cimicifuga.
Cod-liver oil.
Conium.
Copper.
Electricity.
Ether.
Gelsemium.
Hyoscyamia.
Ice-bag, spinal.
Indian hemp.
Iron.
Musk.
Nux vomica.
Opium.
Potassium, bromide of.
Silver, oxide and nitrate of.
Sodium, arseniate of.
Sponging, cold.
Tartar emetic.
Valerian.
Veratrum.
Zinc, iodide, oxide, and sulphate of.

Cirrhosis of Liver. See Liver.

Colic—
Ammonia.
Aniseed.
Antacids.
Assafœtida.
Baths, warm.
Belladonna.
Caraway.
Chloral.
Chloroform.
Cloves.
Counter-irritants.
Ether.
Fennel.
Fomentations.
Ginger.
Lavender.
Lime-water.
Magnesia.
Oils, essential.
Opiates.
Peppermint.
Potassium, bromide of.
Spearmint.
Tobacco.

Colic, Biliary—
Bath, warm.
Chloroform.
Electricity.
Ether.
Fomentations.
Oil of turpentine.
Opiates.

Colic, Lead—
Alum.
Belladonna.
Castor oil.
Chloroform.
Croton oil.
Magnesium, sulphate [of.
Nux vomica.
Sulphuric acid.
Tobacco.

Colic, Renal—
Bath, warm.
Chloroform.
Counter-irritants.
Ether.
Fomentations.
Opium.
Strychnia.

Coma—
Blisters.
Bloodletting.
Cold douche.
Croton oil.
Mustard poultices.
Oil of turpentine.

Condylomata—
Arsenic.
Carbolic acid.
Chromic acid.
Creasote.
Mercury, nitrate and red iodide of.
Nitric acid.
Savine.
Zinc, chloride, iodide, and nitrate of.

Conjunctivitis—
Alum.
Belladonna.
Blisters.
Calomel ointment.
Carbolic acid.
Copper, sulphate of.
Lead, acetate of.
Mercury, yellow oxide [of.
Oleate of mercury and morphia.
Opium, wine of.
Sassafras pith.
Silver, nitrate of.
Zinc, sulphate of.

Constipation—
Aloes.
Belladonna.
Calabar bean.
Castor oil.
Cold.
Colocynth.
Croton oil.
Electricity.
Enemata.
Friedrichshall water.
Gamboge.
Ipecacuanha.
Iron.
Jalap.
Magnesia.
Magnesium, sulphate and carbonate of.
Mercury with chalk.
Nux vomica.
Oil of turpentine.
Oranges.
Podophyllum, resin of.
Rhubarb.
Scammony.
Senna.
Soap.
Strychnia.
Sulphates.
Sulphur.
Tar.
Tobacco.

Contusions—

Acetic acid.
Alcohol.
Ammonium, acetate and chloride of.
Arnica.
Camphor.
Cold.
Hops.
Olive oil.
Sulphurous acid.
(See Sprain.)

Convulsions—

Ammonium, carbonate of.
Amyl, nitrite of.
Anæsthetics.
Assafœtida.
Bloodletting.
Camphor, monobromated.
Chloral.
Chloroform.
Counter-irritants.
Ether.
Ice.
Ice-bag, spinal.
Indian hemp.
Morphia.
Musk.
Mustard.
Physostigma.
Potassium, bromide
Tartar emetic. [of.
Veratrum viride.
Zinc, oxide, and valerianate of.

Coryza—

Acetic acid.
Aconite.
Ammonia.
Ammonium, chloride
Arsenic. [of.
Bath, Turkish.
Camphor.
Cubebs.
Glycerine.
Iodine.
Opium.
Potassium, bromide, chlorate, and iodide
Sulphurous acid. [of.
Tannic acid.

Cough—

Alcohol.
Alum.
Assafœtida.
Bath, Turkish.
Belladonna.
Chloral.
Chloroform.
Cod-liver oil.
Conium.
Croton chloral.
Gelsemium.
Glycerite of tannic acid.
Gum Arabic.
Hydrocyanic acid.
Indian hemp.
Iodine.
Ipecacuanha.
Licorice.
Morphia.
Opium.
Spirit of nitrous ether.
Tar-water.
Tobacco.
Wild cherry.
Zinc, valerianate of.

Croup—

Aconite.
Alum.
Blisters.
Bloodletting
Calomel.
Carbolic acid.
Cauterization.
Copper, sulphate of.
Dry cupping.
Eucalyptus.
Hot water.
Ipecacuanha.
Lime-water.
Lobelia.
Mercury.
Musk.
Potassium, chlorate and iodide of.
Sanguinaria.
Senega.
Silver, nitrate of.
Squill.
Sulphurous acid.
Tannic acid.
Tartar emetic.
Zinc, sulphate of.

Cystitis—

Alkalies.
Buchu.
Cantharides.
Carbolic acid.
Copaiba.
Cubebs.
Enemata, warm.
Iodine.
Iodoform.
Juniper.
Oil of turpentine.
Opium.
Pareira.
Tannic acid.
Uva ursi.
(See Bladder.)

Deafness—

Chloroform.
Creasote.
Electricity.
Ether.
Glycerine.
Glycerite of tannic acid.
Oil of turpentine.

Debility—
Alcohol.
Arsenic.
Bath (sea and Turkish).
Calcium, hypophosphite and phosphate of.
Calumbo.
Cod-liver oil.
Gentian.
Iron.
Quassia.
Quinia.
Sodium, hypophosphite of.
Wild cherry.
(See Adynamia.)

Delirium—
Belladonna.
Chloral.
Cold douche.
Digitalis.
Ether.
Ice.
Opium.
Potassium, bromide of.
Stramonium.
Tartar emetic.
(See Cerebral excitement.)

Delirium Tremens—
Aconite.
Alcohol.
Belladonna.
Bromides.
Camphor, monobromated.
Capsicum.
Chloral.
Chloroform.
Cinchona.
Cold.
Croton oil.
Digitalis.
Ether.
Hops.
Ice.
Indian hemp.
Lupulin.
Morphia.
Mustard.
Opium.
Tartar emetic.
Valerian.
Veratrum viride.
Wines.

Dermatitis—
Astringents.
Black wash.
Corrosive sublimate.
Lead-water.
Starch.

Diabetes—
Ammonium, carbonate of.
Arsenic.
Bath (vapor and warm).
Bran.
Bromides.
Carbolic acid.
Cod-liver oil.
Creasote.
Ergot.
Iron.
Glycerine.
Jaborandi.
Magnesia.
Nitric acid.
Opium.
Oxygen.
Potassium, bicarbonate and bromide of.
Quinia.
Skimmed milk.
Sodium, bicarbonate of.
Strychnia.
Tartar emetic.
Valerian.

Diarrhœa—
Alkalies.
Alum.
Ammonia.
Ammonium, chloride of.
Antacids.
Aromatics.
Arsenic.
Belladonna.
Benzoin.
Bismuth, subnitrate of.
Blackberry.
Burgundy pitch.
Calcium, carbonate and phosphate of.
Calomel.
Camphor.
Capsicum.
Castor oil.
Catechu.
Cerium, oxalate of.
Chalk mixture.
Chamomile.
Charcoal.
Chloroform.
Cinnamon.
Cod-liver oil.
Cold bathing.
Copper, sulphate of.
Corrosive sublimate.
Enemata.
Ergot.
Erigeron.
Eucalyptus.
Galls.
Geranium.
Hæmatoxylon.
Ice-bag, spinal.
Ipecacuanha.
Iron, nitrate and sulphate of.
Kino.
Koumiss.
Lead, acetate of.
Lime-water.
Magnesia.

Diarrhœa—*continued.*

Magnesium, sulphate of.
Mercury with chalk.
Mustard.
Nitrous acid.
Nitric acid.
Nitromuriatic acid.
Nux vomica.
Oil of cajeput.
Opium.
Pepsin.
Podophyllum.
Potassium, chlorate of.
Rhatany.
Rhubarb.
Salicin.
Salicylic acid.
Silver, nitrate of.
Strychnia.
Sugar of milk.
Sulphuric acid.
Tannic acid.
Veratrum album.
Zinc, oxide and sulphate of.

Diphtheria—

Alum.
Bromine.
Capsicum.
Carbolic acid.
Cauterization.
Chloral.
Chlorinated soda.
Chlorine solutions.
Cubebs.
Hypophosphites.
Ice.
Iodine.
Ipecacuanha.
Iron, chloride and sulphate of.
Lime-water.
Muriatic acid.
Oil of turpentine.
Opium.
Phosphites.
Potassium, bromide, chlorate, and permanganate of.
Quinia.
Salicylic acid.
Silver, nitrate of.
Sodium, sulphate and sulphocarbolate of.
Strychnia.
Sulphurous acid.
Tannic acid.
Zinc, sulphate of.

Dropsy—

Acupuncture.
Ammonium, acetate and chloride of.
Blisters.
Buchu.
Calomel.
Cantharides.
Cinchona.
Colchicum.
Colocynth.
Copaiba.
Croton oil.
Digitalis.
Elaterium.
Electricity.
Erigeron.
Gamboge.
Gin.
Hydrocyanic acid.
Iodine.
Iron, iodide of.
Jalap.
Juniper.
Manganese.
Mercury.
Podophyllum.
Potassa, solution of.
Potassium, acetate, bitartrate, bromide, chlorate, iodide, and nitrate of.
Senega.
Spirit of nitrous ether.
Squill.
Strychnia.
Taraxacum.
Uva ursi.
Veratria.

Dysentery—

Aconite.
Alum.
Bath, warm.
Bismuth, subnitrate of.
Calomel.
Cascarilla.
Castor oil.
Cerium, oxalate of.
Cinchona.
Copaiba.
Corrosive sublimate.
Cotton.
Enemata.
Ergot.
Erigeron.
Flaxseed.
Glycerine.
Hamamelis.
Iced enemata.
Iodine.
Ipecacuanha.
Lead, acetate of.
Magnesium, sulphate of.
Morphia.
Nitric acid.
Nitrous acid.
Nux vomica.
Oil of turpentine.
Opium.
Potassium, chlorate of.
Poultices.
Rhatany.
Rhubarb.
Salicylic acid.
Silver, nitrate of.
Sodium, nitrate of.
Starch.
Zinc, sulphate of.

Dysmenorrhœa—
- Aloes.
- Amyl, nitrite of.
- Ammonium, acetate and chloride of.
- Apiol.
- Arsenic.
- Belladonna.
- Borax.
- Camphor.
- Cantharides.
- Castor.
- Chamomile.
- Chloroform.
- Cotton.
- Electricity.
- Ether.
- Guaiac.
- Iodine.
- Indian hemp.
- Massage.
- Nux vomica.
- Rue.
- Savine.

Dyspepsia—
- Absinthium.
- Acids, mineral.
- Alcohol.
- Alkalies.
- Aloes.
- Ammonium, carbonate of.
- Antacids.
- Arsenic.
- Assafœtida.
- Belladonna.
- Bismuth, subnitrate of.
- Calabar bean.
- Calumbo.
- Capsicum.
- Carbolic acid.
- Cascarilla.
- Chamomile.
- Charcoal.
- Cinchona.
- Cod-liver oil.
- Cold-water.
- Conium.
- Creasote.
- Electricity.
- Gentian.
- Ginger.
- Hops.
- Hydrocyanic acid.
- Ipecacuanha.
- Iron.
- Mercury with chalk.
- Magnesia.
- Morphia.
- Muriatic acid.
- Nitric acid.
- Nux vomica.
- Opium.
- Pepsin.
- Piperin.
- Podophyllum.
- Quassia.
- Quinia.
- Rhubarb.
- Salicin.
- Sanguinaria.
- Senna.
- Silver, nitrate of.
- Sodium, carbonate and sulphite of.
- Strychnia.
- Sulphurous acid.
- Tannic acid.
- Taraxacum.
- Zinc, sulphate of.

Dysuria—
- Cantharides.
- Conium.
- Potassium, citrate of.
- Spirit of nitrous ether.
- (See Strangury.)

Ecthyma—
- Acids, mineral.
- Baths, alkaline.
- Carbolic acid.
- Iron.
- Laxatives.
- Lead, subacetate of.
- Poultices.
- Quinia.
- Silver, nitrate of.
- Zinc, oxide of.

Eczema—
- Alkaline lotions.
- Alum.
- Arsenic.
- Bath (Turkish and warm).
- Benzoin.
- Bismuth.
- Black wash.
- Blisters.
- Borax.
- Calcium, carbonate of.
- Camphor.
- Carbolic acid.
- Chloral.
- Cinchona.
- Cod-liver oil.
- Dulcamara.
- Glycerine.
- Glycerite of starch, or of tannic acid.
- Green soap.
- Hot water.
- Iron.
- Laxatives.
- Lead, acetate of.
- Lead-plaster and linseed oil.
- Lime-water.
- Lycopodium.
- Magnesium, carbonate of.
- Mercury.
- Mercury, vapor of.
- Oil of cade.
- Oils.
- Potassium, carbonate and cyanide of.

Eczema—*continued.*

Potassa.
Poultices.
Quinia.
Silver, nitrate of.
Soap.
Starch.
Sulphides.
Sulphur.
Tannic acid.
Tar.
Zinc, oxide and carbonate of.

Emphysema—

Ammonia.
Arsenic.
Camphor.
Chloral.
Cod-liver oil.
Ether.
Hydrocyanic acid.
Iron.
Jaborandi.
Lobelia.
Quinia.
Stramonium.

Empyema—

Carbolic acid.
Chlorine, solutions of.
Iodine.

Endocarditis—

Alkalies.
Ammonia, aromatic spirit of.
Ammonium, carbonate of.
Blisters.
Mercury, preparations of.
Opium.
Potassium, bicarbonate and iodide of.
Poultices.
Sodium, carbonate of.
Vapor-bath.

Enteritis—

Bath, warm.
Calomel.
Cerium, oxalate of.
Enemata.
Flaxseed.
Magnesium, sulphate of.
Opium.
Silver, nitrate of.
(See Dysentery, etc.)

Epilepsy—

Ammonium, bromide and carbonate of.
Amyl, nitrite of.
Arsenic.
Belladonna.
Blisters.
Bromides.
Calabar bean.
Camphor.
Camphor, monobromated.
Chloral.
Cinchona.
Conium.
Copper, salts of.
Counter-irritants.
Digitalis.
Electricity.
Hyoscyamus.
Ice-bag, spinal.
Iron.
Lithium, bromide of.
Musk.
Nux vomica.
Opium.
Potassium, bromide of.
Santonin.
Silver, oxide and nitrate of.
Sodium, bromide of.
Stramonium.
Tartar emetic.
Valerian.
Zinc, oxide and sulphate of.

Epistaxis—

Aconite.
Alum.
Compression.
Digitalis.
Ergot.
Hamamelis.
Hot-water bag, spinal.
Potassium, bromide of.
Tannic acid.

Erysipelas—

Aconite.
Belladonna.
Carbolic acid.
Chloral.
Cinchona.
Collodion.
Iodine.
Iron, chloride and sulphate of.
Lead, nitrate of.
Mercury.
Oil of turpentine.
Quinia.
Salicylic acid.
Silver, nitrate of.
Sodium, sulphite and sulphocarbolate of.
Sulphurous acid.

Erythema—

Alcoholic lotions.
Bath (vapor and warm).
Camphor.
Carbolic acid.
Lead, subacetate of.
Starch.
Tonics.
Zinc, carbonate and oxide of.

Favus. See Tinea favosa.

Fevers—

Acetic acid.
Acid drinks.
Aconite.
Alcohol.
Alkalies.
Ammonium, acetate and chloride of.
Arsenic.
Bath (warm, tepid, etc.).
Belladonna.
Blisters.
Calcium, phosphate of.
Camphor.
Castor oil.
Chloral.
Chlorine.
Cinchona.
Citric acid.
Cold affusion.
Conium.
Digitalis.
Glycerine.
Ice.
Jaborandi.
Magnesium, sulphate of.
Musk.
Mustard.
Opium.
Potassium, acetate, chlorate, and citrate of.
Quinia.
Quinia, bromhydrate of.
Salicin.
Salicylic acid.
Sodium, salicylate of.
Spirit of nitrous ether.
Sponging, warm.
Strychnia.
Sulphuric acid.
Tartar emetic.
Wine.
(See Typhoid, Typhus, etc.)

Fissure of Anus, etc.—

Belladonna.
Benzoic acid.
Castor oil.
Chloral.
Distension, forcible.
Galls.
Ice.
Iodoform
Opium.
Potassium, bromide of.
Sulphur.

Fissure of Nipple. See Nipple.

Flatulence—

Ammonia.
Aromatics.
Assafœtida.
Bismuth.
Capsicum.
Carbolic acid.
Charcoal.
Chloroform.
Diet.
Ipecacuanha.
Mercury with chalk.
Nux vomica.
Oils, essential.
Phosphorus.
Sodium, sulphite of.
Sulphocarbolates.
Sulphurous acid.

Fragilitas Ossium—

Cod-liver oil.
Corrosive sublimate.
Iron.
Phosphates.
Quinia.
Tonics.

Freckles—

Benzoin.
Borax.
Mercury.
Zinc, sulphocarbolate of.
(See Chloasma.)

Frostbite—

Camphor.
Iodine.
Lime, chlorinated.
Oil of turpentine.
Silver, nitrate of.
(See Chilblains.)

Galactorrhœa—

Alcohol.
Belladonna.
Camphor.
Conium.
Ergot.
Gallic acid.
Iodine.
Potassium, iodide of.
Quinia.
Tannic acid.
Tobacco.

Gall-stones. See Calculi, biliary.

Gangrene—

Aconite.
Ammonium, chloride of.
Bromine.
Camphor.
Cantharides.
Carbolic acid.
Charcoal
Chlorine.
Creasote.
Iodine.
Lead.
Nitric acid.
Oak bark.
Oil of turpentine.
Opium.
Potassium, chlorate, iodide, and permanganate of.
Savine.
Sulphuric acid.

Gastralgia—

Alum.
Ammonia, aromatic spirit of.
Amyl, nitrite of.
Arsenic.
Bismuth, subnitrate of.
Hydrocyanic acid.
Manganese.
Morphia.
Nux vomica.
Opium.
Potassium, bicarbonate of.
Sodium, bicarbonate of.

Gastric Catarrh—

Ammonium, chloride of.
Bismuth, subnitrate of.
Cerium, oxalate of.
Silver, oxide and nitrate of.
Sodium, sulphite of.

Gastric Ulcer—

Cerium, oxalate of.
Cold.
Fomentations.
Mustard.
Nutritive enemata.
Oil of turpentine.
Opium.
Potassium, iodide of.
Silver, nitrate of.

Gastritis. See Stomach, inflammation of.

Gastrodynia. See Gastralgia.

Glands, Enlarged—

Ammonium, carbonate and chloride of.
Blisters.
Carbolic acid.
Conium.
Ergot.
Iodine.
Mercury.
Oleate of mercury and morphia.
Potassium, acetate and iodide.

Gleet—

Ammonium, chloride of.
Belladonna.
Bismuth.
Blisters.
Buchu.
Cantharides.
Copaiba.
Copper, sulphate of.
Glycerite of tannic acid.
Iodine.
Iron, tincture of chloride of.
Lead, acetate of.
Lime-water.
Mercury, nitrate of.
Oil of sandal wood.
Oil of turpentine.
Opium.
Silver, nitrate of.
Zinc, chloride and sulphate of.
(See Gonorrhœa.)

Goitre. See Bronchocele.

Goitre, Exophthalmic. See Graves's Disease.

Gonorrhœa—

Aconite.
Alkalies
Atropia.
Benzoic acid.
Bismuth.
Blisters.
Cantharides.
Chloral.
Colchicum.
Colocynth.
Copaiba.
Copper, sulphate of.
Corrosive sublimate.
Cubebs.
Eucalyptus.
Glycerite of tannic acid.
Indian hemp.

Gonorrhœa—*continued.*
Injections.
Iron, chloride and sulphate of.
Jalap.
Lead, acetate of.
Lime, chlorinated.
Matico.
Oil of sandal wood.
Oil of turpentine.
Opium.
Potassium, bromide and permanganate [of.
Quinia.
Salicylic acid.
Silver, nitrate of.
Sulphuric acid.
Tartar emetic.
Zinc, acetate, chloride, sulphate, and sulphocarbolate of.
(See Gleet.)

Gout—
Aconite.
Ammonium, carbonate and phosphate of.
Arsenic.
Bath, Turkish.
Blisters.
Cinchona.
Cod-liver oil.
Colchicum.
Collodion.
Dulcamara.
Guaiac.
Iodine.
Iodoform.
Lithium, benzoate, carbonate, and citrate of.
Lupulin.
Magnesia.
Musk.
Oil of peppermint.
Opium.
Potassium, citrate and iodide of.
Salicylic acid.
Savine.
Sodium, carbonate and salicylate of.
Strychnia.
Sulphides.
Sulphurous acid.
Veratria.

Gravel—
Juniper.
Lime.
Magnesia.
Opium.
Potassium, carbonate of.
Sodium, carbonate of.
Spirit of nitrous ether.
Sulphuric acid.
Uva ursi.

Graves's Disease—
Cod-liver oil
Cold douche.
Digitalis.
Ice.
Iodine.
Wild cherry.

Hæmatemesis—
Alum.
Cold.
Ergot.
Gallic acid.
Hamamelis.
Iron, subsulphate of.
Lead, acetate of.
Oil of turpentine.
Rhatany.
Sulphuric acid
Tannic acid.

Hæmaturia—
Alum.
Copaiba.
Ergot.
Gallic acid.
Hamamelis.
Oil of turpentine.
Quinia.
Tannic acid.

Hæmoptysis—
Alum.
Chloroform.
Cold.
Digitalis.
Ergot.
Gallic acid.
Hamamelis.
Hot-water bag, spinal.
Inhalations, astrin- [gent.
Ipecacuanha.
Iron, acetate and subsulphate of
Lead, acetate of.
Morphia.
Oil of turpentine.
Opium.
Sulphuric acid.
Tannic acid.

Hay Fever—
Antispasmodics.
Arsenic.
Inhalations, atomized.
Iron.
Nux vomica.
Quinia.
Tobacco.

Headache—

Acetic acid.
Aconite.
Actæa racemosa.
Alcohol.
Ammonia.
Ammonium, acetate, carbonate, chloride, and valerianate of.
Amyl, nitrite of.
Antacids.
Arsenic.
Belladonna.
Blisters.
Bromides.
Caffein.
Camphor.
Cold affusion.
Digitalis.
Ergot.
Ether spray.
Friedrichshall water.
Guarana.
Hot sponging.
Hot water.
Ice-bag.
Lavender.
Magnesia.
Mercurial pill.
Morphia.
Mustard.
Nectandra.
Oil of cajeput.
Opium.
Podophyllum.
Potassium, bromide and iodide of.
Poultices.
Purging.
Spirit of nitrous ether.
Strychnia.
Tea.
Veratrum album.
Veratrum viride.
Zinc, oxide of.
(See Sick Headache and Migraine.)

Heart, Dilatation of—

Antispasmodics.
Chalybeates.
Tonics.

Heart, Functional Derangement of—

Ammonia.
Belladonna.
Digitalis.
Ether.
Hyoscyamus.
Iron.
Lupulin.
Opium.
Quinia.
Strychnia.
Wild cherry.

Heart, Hypertrophy of—

Aconite.
Ammonia.
Digitalis.
Ether.
Wild cherry.

Hemicrania. See Migraine.

Hemiplegia—

Blisters.
Cathartics.
Electricity.
Potassium, iodide of.
Strychnia.
(See Paralysis.)

Hemorrhage—

Acetic acid.
Acids.
Alcohol.
Alum.
Astringents.
Cantharides.
Chromic acid.
Cinchona.
Citric acid.
Cold.
Collodion.
Copper, sulphate of.
Creasote.
Digitalis.
Dover's powder.
Ergot.
Erigeron.
Gallic acid.
Hamamelis.
Hæmatoxylon.
Hot-water bag, spinal.
Hyoscyamus.
Ice.
Ipecacuanha.
Iron, acetate, ammonio-sulphate, chloride, and sulphate of.
Lead, acetate of.
Mercury.
Oak bark.
Oil of turpentine.
Opium.
Quinia.
Rhatany.
Silver, nitrate of.
Sulphuric acid.
Tannic acid.
Tartar emetic.
Transfusion.
Zinc, sulphate of.
(See Hæmoptysis, Hæmaturia, etc.)

Hemorrhage, Gastric. See Hæmatemesis.

Hemorrhage, Intestinal—
Bismuth. Catechu. Copper, sulphate of. Gallic acid. Iron alum. Kino. Logwood. Opium. (See Dysentery and Hemorrhage.)

Hemorrhage, Pulmonary. See Hæmoptysis.

Hemorrhage, Uterine—
Catechu. Cinnamon. Cold. Corrosive sublimate. Electricity. Ergot. Gallic acid. Hemp. Hot water injections. Iodoform. Iron, perchloride and ammonio-sulphate of. Lead, acetate of. Potassium, bromide of. Savine. Sulphuric acid, aromatic.

Hemorrhoids. See Piles.

Hepatitis—
Ammonium, chloride of. Blisters. Ipecacuanha. Leeches. Mercury. Nitromuriatic acid. Opium. Purgatives. Taraxacum.

Hernia—
Belladonna. Cold. Ether. Iodine. Potassa. Tartar emetic. Tobacco.

Herpes—
Acetic acid. Collodion. Fomentations, hot. Iodine. Lead, subacetate of. Oleate of morphia. Silver, nitrate of. Starch. Tar. Zinc, oxide of.

Herpes Zoster—
Atropia. Collodion. Electricity. Ergot. Iron. Morphia. Nux vomica. Phosphorus. Quinia. Starch. Zinc, phosphide of.

Hiccup—
Belladonna. Camphor. Chloral. Chloroform. Cinchona. Ether. Morphia. Musk. Mustard. Oils, essential. Tobacco.

Hoarseness—
Alum. Bath, Turkish. Borax. Catechu. Glycerite of tannic acid. Guaiac. Lemon juice. Nitric acid. Sulphurous acid. White of egg.

Hooping-Cough. See Whooping-Cough.

Hydrocele—
Ammonium, chloride of. Carbolic acid. Digitalis. Electricity. Iodine. Potassium, chlorate of. Squill.

Hydrocephalus, Acute—
Bromine.
Cold.
Iodine.
Laxatives.
Leeches.
Mercury.
Potassium, iodide of.
Purgatives.
Tartar emetic.

Hydrocephalus, Chronic—
Aperients.
Calomel.
Cod-liver oil.
Cold douche.
Compression.
Glycerine.
Iron, iodide of.
Issue.
Mercury.
Potassium, acetate and iodide of.
Squill.

Hydrophobia—
Acetic acid.
Amyl, nitrite of.
Atropia.
Cantharides.
Chloral.
Chloroform.
Escharotics.
Excision.
Morphia.
Silver, nitrate of.
Sodium, hyposulphite and sulphite of.
Strychnia.

Hypochondriasis—
Assafœtida.
Bathing, sea.
Cinchona.
Hyoscyamus.
Physical training.
Potassium, bromide of.
Tonics.

Hysteria—
Aconite.
Alcohol.
Antispasmodics.
Assafœtida.
Bathing, sea, etc.
Bromides.
Camphor.
Camphor, monobromated.
Castor.
Chloroform.
Cod-liver oil.
Cold.
Electricity.
Ether.
Garlic.
Gold and sodium, chloride of.
Indian hemp.
Iron.
Musk.
Nux vomica.
Oils, volatile.
Opium.
Phosphorus.
Potassium, bromide of.
Quinia.
Spirit of nitrous ether
Valerian.
Zinc, phosphide and valerianate of.

Ichthyosis—
Arsenic.
Baths (alkaline, vapor, and warm).
Cod-liver oil.

Impetigo—
Arsenic.
Baths (vapor and warm).
Cod-liver oil.
Copper, sulphate of.
Creasote.
Glycerine.
Lead.
Mercury, ammoniated.
Mercury, nitrate of.
Nitric acid.
Oils.
Purgatives, saline.
Quinia.
Silver, nitrate of.
Sulphur.
Zinc, carbonate and oxide of.

Impotence—
Cantharides.
Electricity.
Nux vomica.
Oil of turpentine.
Phosphorus.
Strychnia.
Zinc, phosphide of.

Incontinence of Urine—
Baths (warm, salt, and tepid).
Belladonna.
Benzoin.
Bromides.
Buchu.
Cantharides.
Chloral.
Chromic acid.
Cubebs.
Ergot.
Hops.

Incontinence of Urine—*continued.*

Hyoscyamus.
Iodine.
Iron, bromide, iodide, and perchloride of.
Lupulin.
Nitro-muriatic acid.
Nux vomica.
Oil of turpentine.
Opium.
Pareira.
Potassa, solution of.
Potassium, nitrate of.
Strychnia.
Triticum repens.

Inflammation—

Aconite.
Alcohol.
Ammonium, chloride [of.
Belladonna.
Bloodletting.
Camphor.
Chlorinated lime.
Cod-liver oil.
Cold.
Corrosive sublimate.
Digitalis.
Dover's powder.
Ether
Fomentations.
Hydrocyanic acid.
Ice.
Iodine.
Mercury.
Opium.
Poultices.
Purgatives.
Sulphides.
Tartar emetic.
Veratrum viride.

Influenza—

Actæa racemosa.
Ammonium, chloride [of.
Ammonium, solution of acetate of.
Baths (vapor or warm).
Dover's powder.
Flaxseed.
Jaborandi.
Mustard.
Sulphurous acid.

Insanity. See Mania, Melancholia, etc.

Insomnia—

Alcohol.
Bath, warm.
Belladonna.
Bromides.
Camphor, monobromated.
Chloral.
Chloroform.
Codeia.
Cold.
Conium.
Croton chloral.
Ether.
Hemp.
Hyoscyamus.
Iodoform.
Morphia.
Opium.
Potassium, bromide of.
Tartar emetic.
Zinc, phosphide of.

Intermittent Fever—

Ammonium, carbazotate and chloride of.
Amyl, nitrite of.
Angustura.
Apiol.
Arsenic.
Bromides.
Cantharides.
Capsicum.
Cascarilla.
Chamomile.
Chloroform.
Cinchona.
Cinchonia.
Cinchonidia.
Copper, sulphate of.
Eucalyptus.
Hops.
Iodine.
Ipecacuanha.
Iron.
Nitric acid.
Nux vomica.
Opium.
Piperin.
Quinia.
Quinia, bromhydrate of.
Quinidia.
Quinoidine.
Salicin.
Salicylic acid.
Santonin.
Sodium, salicylate and sulphite of.
Tartar emetic.
Zinc, sulphate of.

Intertrigo—

Bismuth, subcarbonate and subnitrate of.
Calcium, carbonate of.
Camphor.
Chalk.
Glycerite of tannic acid.
Lycopodium.
Sage.
Silver, nitrate of.
Soap.
Zinc, oxide and precipitated carbonate [of.
(See Erythema.)

Iritis—
Atropia.
Belladonna.
Calabar bean.
Mercury.
Oil of turpentine.
Salicylic acid.

Itch. See Scabies.

Jaundice—
Acids, mineral.
Alkalies.
Aloes.
Belladonna.
Benzoic acid.
Citric acid.
Ipecacuanha.
Lemon juice.
Magnesium, carbonate and sulphate of.
Mercury.
Nitric acid.
Nitromuriatic acid.
Podophyllum.
Potassium, salts of.
Purgatives.
Silver, nitrate of.
Sodium, sulphate of.
Taraxacum.

Joints, Affections of—
Baths (alkaline, arsenical, and sulphur).
Blisters.
Cold douche.
Cod-liver oil.
Conium.
Digitalis.
Galvanism.
Iodine.
Massage.
Mercury.
Oleate of mercury.
Sulphuric acid.
(See Arthritis.)

Lactation, Defective—
Aniseed.
Calabar bean.
Castor oil.
Cotton.
Electricity.
Fennel.
Sage.

Lactation, Excessive. See Galactorrhœa.

Laryngismus Stridulus—
Ammonia.
Assafœtida.
Belladonna.
Chloral.
Chloroform.
Cinchona.
Cod-liver oil.
Cold affusion.
Electricity.
Ether.
Ice-bag, spinal.
Lobelia.
Musk.
Mustard.
Potassium, bromide of.
Sponging, cold.
Valerian.

Laryngitis—
Aconite.
Alum.
Balsam of Peru.
Belladonna.
Carbolic acid.
Catechu.
Copper, sulphate
Diaphoretics.
Dover's powder.
Glycerine.
Hot water.
Inhalations, atomized.
Iodine.
Ipecacuanha.
Lime.
Mercury.
Morphia.
Mustard.
Opium.
Potassium, chlorate of.
Silver, nitrate of.
Sugar.
Sulphurous acid.
Tannic acid.
Tartar emetic.

Lead Paralysis—
Baths (warm and sulphur).
Electricity.
Friction.
Potassium, iodide of.
Strychnia.
Sulphuric acid

Lepra. See Psoriasis.

Leucæmia—
Cinchona.
Cod-liver oil.
Ergot.
Iodine.
Iron.
Quinia.
Phosphorus.

Leucorrhœa—
Alkalies.
Aloes.
Alum.
Ammonium, chloride of.
Arsenic.
Belladonna.
Bismuth.
Calcium, phosphate of.
Cantharides.
Carbolic acid.
Copaiba.
Copper, sulphate of.
Creasote.
Cubebs.
Ergot.
Glycerine.
Ice-bag, spinal.
Injections, vaginal.
Iodine.
Iron.
Kino.
Lead, acetate of.
Lime-water.
Mercury.
Oak bark.
Potassium, bicarbonate, chlorate, and permanganate of.
Pyroligneous acid.
Rhatany.
Silver, nitrate of.
Sodium, bicarbonate of.
Sponging, cold.
Tannic acid.
Zinc, acetate and sulphate of.

Lichen—
Alkalies.
Arsenic.
Baths (alkaline and warm).
Calomel.
Cantharides.
Carbolic acid.
Chloroform.
Cod-liver oil.
Corrosive sublimate.
Hydrocyanic acid.
Iron.
Laxatives.
Lead-water.
Mercury, nitrate of.
Silver, nitrate of.
Sulphides.
Tar.
Tonics.
Zinc, oxide of.

Lithiasis—
Ammonium, carbonate of.
Lithium, carbonate of.
Magnesia.
Potassa, solution of.
Potassium, acetate of.
Sodium, carbonate of.

Liver, Cirrhosis of—
Aperients.
Blisters.
Cupping.
Iodine.
Iron, iodide of.
Leeching.
Nitro-muriatic acid.
Potassium, iodide of.
Quinia.

Liver, Congestion of—
Lemon-juice.
Mineral waters.
Nitric acid.
Saline purgatives.
Taraxacum.

Liver, Hypertrophy of—
Ammonium, chloride of.
Bromides.
Nitromuriatic acid.
Podophyllum.
Sodium, carbonate of.

Liver, Inflammation of. See Hepatitis.

Locomotor Ataxy—
Baths, sulphur.
Belladonna.
Blisters.
Cod-liver oil.
Galvanism.
Indian hemp.
Iodine.
Leeches.
Opium.
Phosphorus.
Silver, nitrate of.

Lumbago—
Actæa racemosa.
Arsenic.
Bath, warm.
Belladonna.
Calabar bean.
Capsicum.
Cimicifuga.
Corrosive sublimate.
Ether spray.
Galvanism.
Ice.
Iodine.
Massage.
Mercury.
Morphia.
Potassium, iodide and nitrate of.
Poultices.
Veratrum viride.
(See Rheumatism.)

Lungs, Inflammation of. See Pneumonia.

Lupus—

Arsenic.
Blisters.
Calomel.
Carbolic acid.
Caustics.
Chromic acid.
Cod-liver oil.
Corrosive sublimate.
Glycerine.
Iodine.
Lead.
Mercury, acid nitrate and iodide of.
Mercurial ointment.
Nitric acid.
Phosphorus.
Potassa.
Potassium, iodide of.
Silver, nitrate of.
Soft soap.
Sulphur.
Sulphur, iodide of.
Tar.
Zinc, chloride. iodide, and nitrate of.

Mania—

Actæa racemosa.
Blisters.
Camphor.
Chloral.
Cold douche.
Conium.
Croton oil.
Ergot.
Ether.
Hyoscyamus.
Indian hemp.
Morphia.
Opium.
Phosphorus.
Potassium, bromide of.
Tartar emetic.

Mania a Potu. See Delirium Tremens.

Mania, Puerperal. See Puerperal.

Marasmus. See Tabes Mesenterica.

Measles—

Aconite.
Ammonia, carbonate of.
Cold affusion.
Diaphoretics.
Fat.
Lard.
Mustard.
Purgatives.
Veratrum viride.

Melancholia—

Alcohol.
Amyl, nitrite of.
Camphor.
Hemp.
Musk.
Phosphorus.
Potassium, bromide of.

Meningitis—

Antimonial ointment.
Antiphlogistics.
Blisters.
Bromine.
Chloral.
Cold.
Croton oil.
Digitalis.
Ice.
Iodine.
Leeches.
Mercury.
Mustard.
Opium.
Potassium, bromide and iodide of.
Purgatives.
Tartar emetic.
(See Hydrocephalus.)

Meningitis, Cerebro-spinal—

Blisters.
Bloodletting.
Calomel.
Cinchona.
Cold.
Leeches.
Morphia.
Purging.
(See Meningitis.)

Menorrhagia—

Actæa racemosa.
Aloes.
Alum.
Ammonium, acetate and chloride of.
Borax.
Calcium, phosphate of.
Cold.
Digitalis.
Ergot.
Erigeron.
Gallic acid.
Hot water bag, spinal.
Indian hemp.
Iron, chloride of.
Ipecacuanha.
Kino.
Lead.
Leeches.
Oil of turpentine.
Phosphates.
Potassium, bromide of.
Quinia.
Rhatany.
Savine.
Transfusion.
Zinc, phosphide of.

Metritis—
- Antiphlogistics.
- Baths (hot hip).
- Belladonna.
- Leeches.
- Mercury.
- Opium.
- Potassium, bromide and iodide of.
- Warm douches.

Metrorrhagia. See Hemorrhage, uterine, and Menorrhagia.

Migraine—
- Ammonium, chloride of.
- Amyl, nitrite of.
- Arsenic.
- Caffein, citrate of.
- Croton chloral.
- Ergot.
- Potassium, bromide of.
- (See Headache and Neuralgia.)

Myalgia—
- Ammonium, chloride of.
- Belladonna.
- Ether.
- Iodine.
- Opium.
- Poultices.
- (See Rheumatism.)

Myelitis—
- Hot iron.
- Moxa.
- Potassium, iodide of.
- Silver, nitrate of.
- (See Brain, inflammation of, and Meningitis.)

Nævus—
- Collodion.
- Corrosive sublimate.
- Creasote.
- Iron.
- Lime.
- Nitric acid.
- Potassa.
- Vaccination.
- Zinc, chloride, iodide, and nitrate of.

Nephritis—
- Antiphlogistics.
- Baths (hot hip, hot air, vapor).
- Belladonna.
- Cups.
- Diaphoretics.
- Leeches.
- Opium.
- Poultices.
- Purgatives.
- (See Bright's Disease.)

Nervousness—
- Assafœtida.
- Chloral.
- Chloroform.
- Potassium, bromide of.
- Sponging, cold.
- Valerian.
- Zinc, phosphide of.

Neuralgia—
- Aconite.
- Alcohol.
- Ammonium, chloride of.
- Amyl, nitrite of.
- Apiol.
- Arsenic.
- Assafœtida.
- Atropia.
- Belladonna.
- Blisters.
- Bromides.
- Camphor, monobromated.
- Cannabis.
- Capsicum.
- Chamomile.
- Chloral.
- Chloroform.
- Cinchona.
- Cod-liver oil.
- Colchicum.
- Cold.
- Conium.
- Creasote.
- Counter-irritation.
- Croton chloral.
- Electricity.
- Ergot.
- Ether.
- Gelsemium.
- Hydrocyanic acid.
- Hyoscyamus.
- Ice-bag, spinal.
- Iodine.
- Iodoform.
- Iron.
- Lead.
- Morphia.
- Mustard.
- Nux vomica.
- Oil of peppermint.
- Oil of turpentine.
- Opium.
- Phosphorus.
- Physostigma.
- Potassium, bromide, iodide, and chlorate of.

Neuralgia—*continued.*

Quinia.
Quinia, bromhydrate of.
Salicylic acid.
Silver, nitrate of.
Sodium, salicylate of.
Stramonium.
Strychnia.
Sulphur baths.
Valerianic acid.
Veratria.
Veratrum viride.
Zinc, oxide, phosphide, sulphate, and valerianate of.

Neuritis—

Aconite.
Belladonna.
Colchicum.
Potassium, iodide of.
Poultices, sedative.
Quinia.
Quinia, bromhydrate of.

Night Sweats—

Alum.
Belladonna.
Ergot.
Gallic acid.
Sulphuric acid.
(See Perspiration.)

Nipples, Sore—

Alcohol.
Balsam of Peru.
Benzoin.
Borax.
Brandy and water.
Carbolic acid.
Catechu.
Chloral.
Collodion.
Copaiba.
Iodoform.
Lead, nitrate of.
Lime-water.
Picric acid.
Rhatany.
Salicylic acid.
Silver, nitrate of.
Soda, chlorinated.
Sulphurous acid.
Tannic acid.
Tar.
Zinc, oxide of.
Zinc shield.

Nymphomania—

Bromides.
Camphor.

Obstruction of Bowels—

Belladonna.
Electricity.
Enemata.
Henbane.
Mercury.
Morphia.
Opium.
Purgatives.
Tobacco.

Onychia—

Arsenic.
Cod-liver oil.
Corrosive sublimate.
Iron.
Lead, nitrate of.
Zinc, sulphate of.

Ophthalmia—

Alum.
Blisters.
Cod-liver oil.
Iodine.
Iron.
Lead.
Lime, chlorinated.
Opium.
Silver, nitrate of.
Tannic acid.
Tartar emetic.
Zinc, acetate, oxide, and sulphate of.
(See Conjunctivitis.)

Orchitis—

Antiphlogistics.
Cold.
Compression.
Hyoscyamus.
Ice.
Jaborandi.
Leeches.
Mercury.
Opium.

Osteomalacia. See Rickets.

Otalgia—

Anæsthetics.
Anodynes.
Blisters.
Chloral.
Chloroform vapor.
Dover's powder.
Ether.
Ether, hydrobromic.
Laudanum.
Leeches.
Morphia.
Opium.
Silver, nitrate of.

Otitis—
- Anodynes.
- Antiphlogistics.
- Leeches.

Otorrhœa—
- Alum.
- Glycerite of tannic acid.
- Iodine.
- Lead, acetate of.
- Lime-water.
- Potassium, permanganate of.
- Salicylic acid.
- Silver, nitrate of.
- Styptic cotton.
- Zinc, sulphate of.

Oxaluria—
- Nitric acid.
- Nitro-muriatic acid.
- Sodium, phosphate of.

Ozæna—
- Aluminium, acetate of.
- Alum.
- Bismuth.
- Carbolic acid.
- Chlorine solutions.
- Cod-liver oil.
- Creasote.
- Electricity.
- Glycerite of tannic acid.
- Inhalations.
- Iodine.
- Lead.
- Mercury, nitrate of.
- Potassium, chlorate and permanganate of.
- Rhatany.
- Salicylic acid.
- Silver, nitrate of.
- Tannic acid.
- Zinc, chloride and oxide of.

Pain—
- Atropia.
- Baths (warm and hot).
- Belladonna.
- Chloral.
- Chloroform.
- Ether.
- Fomentations.
- Heat.
- Morphia.
- Nitrous oxide.
- Opium.
- Potassium, bromide of.
- Poultices.
- Water (hypodermically).

Palpitation—
- Belladonna.
- Bending the body.
- Bromides.
- Camphor.
- Cinchona.
- Valerian.

Paralysis—
- Belladonna.
- Calabar bean.
- Cantharides.
- Cinchona.
- Conium.
- Counter-irritation.
- Electricity.
- Ergot.
- Indian hemp.
- Iodine.
- Nux vomica.
- Oil of cajeput.
- Phosphorus.
- Silver, nitrate of.
- Strychnia.
- Toxicodendron.
- (See Hemiplegia, Paraplegia, etc.)

Parametritis—
- Aperients.
- Belladonna.
- Blisters.
- Conium.
- Enemata.
- Fomentations.
- Hot hip-baths.
- Injections of hot water.
- Leeches.
- Mercurial ointment.
- Morphia.
- Opium.
- Poultices.
- Salicin.
- Suppositories.

Paraplegia—
- Belladonna.
- Cod-liver oil.
- Ergot.
- Hemp.
- Hyoscyamus.
- Phosphorus.
- Potassium, iodide of.
- Silver, nitrate of.
- (Seo Paralysis.)

Pemphigus—
- Arsenic.
- Cinchona.
- Cod-liver oil.
- Iron.
- Nitro-muriatic acid.
- Quinia.

Pericarditis—
Alkaline drinks.
Baths, vapor.
Cold.
Digitalis.
Leeches.
Mercury.
Opium.
Potassium, bicarbonate and iodide of.
Poultices.
Veratrum viride.

Perimetritis—
Belladonna.
Opium.
Poultices.

Periostitis—
Blisters.
Iodine.
Lead.
Leeches.
Oleate of mercury.
Phosphates.
Potassium, iodide of.

Peritonitis, Acute—
Aconite.
Blisters.
Cold.
Fomentations.
Iodine.
Leeches.
Mercury.
Oil of turpentine.
Opium.
Poultices.
Veratrum viride.
(See Puerperal Peritonitis.)

Peritonitis, Chronic—
Blisters.
Cod-liver oil.
Iodine.
Iron, iodide of.
Liniments, stimulating.
Pepsin.

Pernicious Anæmia—
Arsenic.
Cod-liver oil.
Digitalis.
Iodine.
Phosphorus.
Quinia.
Transfusion.

Perspiration, Excessive—
Alum.
Atropia.
Belladonna.
Chalk.
Ergot.
Gallic acid.
Ice-bag, spinal.
Lead plaster.
Oils.
Quinia.
Silver, oxide of.
Sponging, acid.
Sponging, hot.
Sulphuric acid.
Tannic acid.
Zinc, oxide of.
(See Night Sweats.)

Pharyngitis—
Alum.
Ammonium, chloride of.
Capsicum.
Carbolic acid.
Catechu.
Gum Arabic.
Iodine.
Myrrh.
Potassium, chlorate of.
Sage.
Salicylic acid.
Silver, nitrate of.
Tannic acid.

Phlebitis—
Blisters.
Fomentations.
Poultices.
Purgatives.

Phlegmasia Dolens—
Blisters.
Digitalis.
Fomentations
Leeches.
Lotions, evaporating.
Opium.

Phthisis—
Alcohol.
Arsenic.
Atropia.
Belladonna.
Benzoin.
Blisters.

Phthisis—*continued.*

Brandy.
Burgundy pitch.
Calcium, hypophosphite and phosphate of.
Carbolic acid.
Chloral.
Chlorine.
Chloroform.
Cinchona.
Cocoanut oil.
Cod-liver oil.
Conium.
Corrosive sublimate.
Counter irritants.
Creasote.
Croton chloral.
Digitalis.
Enemata.
Ether.
Eucalyptus.
Gallic acid.
Gelsemium.
Glycerine.
Hypophosphites.
Indian hemp.
Inhalations, atomized.
Injections of diluted Lugol's solution.
Iodine.
Ipecacuanha.
Iron.
Kino.
Lead.
Morphia.
Oak bark.
Opium.
Oxygen.
Phosphates.
Phosphorus.
Potassa, solution of.
Potassium, chlorate of.
Quinia.
Salicin.
Sea bathing.
Silver, nitrate of.
Sodium, hypophosphite of.
Sponging, hot.
Sulphuric acid.
Sulphurous acid.
Tannic acid.
Taraxacum.
Vinegar.
Walnut leaves.
Wild cherry.

Piles—

Alum.
Amber.
Calomel.
Carbolic acid.
Castor oil.
Chromic acid.
Cold injections.
Cubebs.
Ergot.
Gallic acid.
Galls.
Hamamelis.
Iodoform.
Iron, chloride of.
Lead plaster.
Nitric acid.
Oak bark.
Opium.
Pepper.
Podophyllum, resin of.
Potassium, bitartrate and bromide of.
Rhubarb.
Stramonium.
Sulphur.
Tannic acid.
Tobacco.

Pityriasis—

Aperients.
Arsenic.
Borax.
Chloral.
Diuretics.
Glycerine.
Glycerite of borax.
Iron.
Mercury, ammoniated and nitrate of.
Oil of cajeput
Oils.
Quinia.
Sulphurous acid.

Pleurisy—

Aconite.
Aspiration.
Blisters.
Bloodletting.
Burgundy pitch.
Cod-liver oil.
Counter-irritants.
Cups.
Diaphoretics.
Digitalis.
Iodine.
Jaborandi.
Leeches.
Liquor potassæ.
Mercury.
Morphia.
Opium.
Potassium, iodide and nitrate of.
Poultices.
Squill.
Tartar emetic.
Veratrum viride.

Pleurodynia—

Actæa racemosa.
Ammonia. [warm).
Baths (Turkish and
Belladonna.
Blisters.
Chloral.
Cinchona.
Croton oil.
Ether.
Iodine.
Liniments.
Mustard.
Opium.
Poultices.
Revellents.

Pneumonia.
- Aconite.
- Alcohol.
- Ammonium, carbonate of.
- Belladonna.
- Benzoic acid.
- Blisters.
- Brandy.
- Camphor.
- Chloroform.
- Cinchona.
- Cold.
- Cups.
- Digitalis.
- Ipecacuanha.
- Leeches.
- Mercury.
- Morphia.
- Musk.
- Oil of turpentine.
- Opium.
- Phosphorus.
- Potassium, nitrate of.
- Poultices.
- Quinia.
- Senega.
- Serpentaria.
- Tartar emetic.
- Veratrum viride.
- Veratria.
- Wine.

Priapism—
- Belladonna.
- Bromides.
- Camphor.
- Chloroform.
- Hops.
- Ice-bag, spinal.
- Lupulin.
- Suppositories.
- Veratrum.

Prolapsus—
- Alum.
- Catechu.
- Hæmatoxylon.
- Ice.
- Kino.
- Krameria.
- Strychnia.
- Sulphur.
- Tannic acid.

Prostatitis—
- Cantharides.
- Hot injections.

Prurigo—
- Aconitia.
- Arsenic.
- Baths (alkaline, warm, creasote, sulphur, and Turkish).
- Belladonna.
- Borax.
- Calcium, sulphide of.
- Cantharides.
- Carbolic acid.
- Chloroform.
- Cod-liver oil.
- Corrosive sublimate.
- Creasote.
- Hydrocyanic acid.
- Ice.
- Iodoform.
- Iron.
- Laxatives.
- Lime-water.
- Oil of cade.
- Opium.
- Potassium, cyanide of.
- Strychnia.
- Sulphur.
- Sulphuric acid.
- Tar.
- Tobacco.
- Tonics.
- Vinegar.
- (See Pruritus.)

Pruritus—
- Acetic acid.
- Alcohol.
- Alkalies.
- Alum.
- Aluminium, nitrate of.
- Arsenic.
- Atropia.
- Baths (alkaline, medicated, vapor, and warm).
- Belladonna.
- Benzoin.
- Bismuth and morphia.
- Boracic acid.
- Borax.
- Calomel.
- Camphor.
- Carbolic acid.
- Chloral.
- Chloroform.
- Chromic acid.
- Cider.
- Cod-liver oil.
- Corrosive sublimate.
- Douches.
- Electricity.
- Glycerine.
- Hot water injections.
- Hydrocyanic acid.
- Iodoform.
- Iron.
- Laxatives.
- Lead, iodide of.
- Lead lotions.
- Mercury, nitrate of.
- Morphia.
- Potassium, carbonate, cyanide, and sulphide of.
- Quinia.
- Silver, nitrate of.
- Sodium, carbonate and sulphites.
- Sponging.
- Sulphur.
- Tannic acid.
- Tar.
- Tobacco.
- Vinegar.
- Zinc, sulphocarbolate of.

Pruritus Vulvæ. See Pruritus.

Psoriasis—

Alkalies.
Arsenic.
Bath (alkaline, Turkish, and warm).
Calcium, sulphuret of.
Calomel.
Cantharides.
Carbolic acid.
Cod-liver oil.
Colchicum.
Copaiba.
Copper, sulphate of.
Corrosive sublimate.
Creasote.
Fats.
Glycerine.
Green soap.
Hypophosphites.
Iodine.
Iron.
Mercurial vapor bath.
Mercury, ammoniated, iodide and nitrate of.
Oils.
Petroleum.
Phosphorus.
Potassium, iodide of.
Purgatives, saline.
Quinia.
Silver, nitrate of.
Soap.
Sulphides.
Sulphur.
Sulphur, iodide of.
Tar.

Ptyalism. See Salivation.

Puerperal Fever—

Chloral.
Cinchona.
Enemata.
Fomentations, sedative.
Iron.
Morphia.
Oil of turpentine.
Opium.
Potassium, bromide of.
Poultices.
Quinia.
Tartar emetic.

Puerperal Mania—

Aconite.
Ammonia.
Bloodletting.
Brandy.
Camphor.
Chloral.
Chloroform.
Cinchona.
Cod-liver oil.
Hyoscyamus.
Indian hemp.
Morphia.
Opium.
Phosphoric acid.
Quinia.
Stramonium.
Veratrum viride.
Wine.

Purpura—

Acids (mineral and vegetable).
Arsenic.
Ergot.
Gallic acid.
Iron.
Oil of turpentine.
Purgatives.
Quinia.
Sulphuric acid.

Pyæmia—

Alcohol.
Ammonia.
Bismuth, subnitrate of.
Carbolic acid.
Cinchona.
Ether.
Hyposulphites.
Iron, tincture of chloride of.
Lead, acetate of.
Muriatic acid.
Nitric acid.
Opium.
Quinia.
Salicylic acid.
Stimulants.
Sulphites.
Sulphurous acid.

Pyelitis—

Alkalies.
Bath, warm.
Blisters.
Buchu.
Cold.
Copaiba.
Cups.
Juniper.
Leeches.
Morphia.
Oil of turpentine.
Opium.
Uva ursi.
(See Nephritis.)

Pyrosis—

Bismuth.
Gallic acid.
Kino.
Manganese.
Silver, nitrate and oxide of.
Sodium, sulphite of.

Remittent Fever—

Acids.
Arsenic.
Cinchona.
Cinchonia.
Cold drinks.
Iodine.
Ipecacuanha.
Laxatives.
Mercury.
Morphia.
Nitric acid.
Opium.
Quinia.
Serpentaria.
Sponging, tepid.

Retention of Urine—

Cantharides.
Ergot.
Indian hemp.
Nux vomica.
Stramonium.
Strychnia.

Rheumatism, Acute—

Aconite.
Actæa racemosa.
Ammonium, bromide and citrate of.
Arsenic.
Baths (hot air, vapor, and Turkish).
Belladonna.
Blisters.
Carbolic acid.
Cimicifuga.
Colchicum.
Cold water.
Conium.
Dover's powder.
Electricity.
Iodine.
Iron, chloride of.
Jaborandi.
Lemon-juice.
Lime-juice.
Morphia.
Opium.
Potassium, bicarbonate, citrate, cyanide, iodide, and nitrate of.
Poultices.
Propylamin.
Quinia.
Salicin.
Salicylate of sodium.
Salicylic acid.
Saline purgatives
Sassafras.
Sodium, bicarbonate and nitrate of.
Sponging, cold.
Sulphurous acid.
Veratria.
Veratrum album.
Wadding.
Wet packing.
Zinc, cyanide of.

Rheumatism, Chronic—

Actæa racemosa.
Alcohol.
Ammonium, carbonate and phosphate [of.
Arsenic.
Atropia.
Bath (Turkish, warm, etc.).
Belladonna.
Blisters.
Burgundy pitch plas- [ter.
Camphor.
Capsicum.
Carbolic acid.
Carbonic acid.
Chloral.
Chloroform.
Cinchona.
Cod-liver oil.
Colchicum.
Cold douche.
Corrosive sublimate.
Electricity.
Galvanism.
Guaiac.
Ice.
Iodine.
Iodoform.
Liniments, stimulat- [ing.
Magnesia.
Mercurial ointment.
Oil of cajeput.
Oleate of mercury and morphia.
Opium.
Potassium, acetate, bicarbonate, iodide, and nitrate of.
Poultices.
Quinia.
Salicylic acid.
Serpentaria.
Sulphides.
Sulphur.
Veratria.

Rheumatism, Muscular—

Aconite.
Alcohol.
Baths.
Cups.
Dover's powder.
Electricity.
(See Rheumatism, Chronic, and Myalgia).

Rickets—

Baths (astringent, chalybeate, sea-water, etc.).
Calcium, carbonate and phosphate of.
Cod-liver oil.
Iron.
Lime-water.
Phosphates.
Phosphorus.
Quinia
Sponging, cold, or salt.
Tannic acid.

Salivation—
Acids.
Alcohol.
Alum.
Atropia.
Belladonna.
Borax.
Chlorinated solutions.
Iodiue.
Laxatives.
Lead, acetate of.
Lime, chloriuated.
Nitric acid.
Oak bark.
Opium.
Potassium, chlorate, iodide, and permanganate of.
Rhatany.
Sage.
Silver, uitrate of.
Tartar emetic.
Tea.
Ziuc, sulphate of.

Scabies—
Alkalies.
Balsam of Peru.
Baths.
Chalk.
Glycerine.
Green soap.
Lime, chloriuated.
Petrolenm.
Potassium, carbonate and iodide of.
Storax.
Sulphur.
Sulphur baths.
Sulphurous acid.
Tar.
Veratrum album.

Scarlet Fever—
Aconite.
Ammonium, carbonate of.
Almond oil.
Belladonna.
Cacoa butter.
Capsicum.
Carbolic acid.
Chloral.
Chlorine water.
Cinchona.
Cold affusion.
Cold applications.
Colchicum.
Fat.
Ice.
Iron.
Juniper.
Lard.
Magnesium, sulphate of.
Mercury with chalk.
Mustard.
Nitric acid.
Oils.
Potassium, chlorate and citrate of.
Quinia.
Salicylic acid.
Silver, nitrate of.
Sponging.
Strychnia.
Sulphocarbolate of sodium.
Sulphurous acid.
Veratrum viride.

Sciatica—
Aconite.
Acupuncturation.
Actæa racemosa.
Ammonium, chloride of.
Atropia.
Baths (Turkish and warm.)
Belladonna.
Blisters.
Burgundy pitch.
Cauterization.
Chloroform.
Cod-liver oil.
Conium.
Counter-irritation.
Creasote.
Croton oil.
Cups.
Electricity.
Ether.
Galvanism.
Iodine.
Morphia.
Oil of turpentine.
Potassium, iodide of.
Poultices.
Salicylate of sodium.
Sulphur.
Veratria.
Veratrum viride.
Zinc, cyanide of.
(See Neuralgia.)

Scrofula—
Alcohol.
Calcium, chloride, iodide, phosphate, and sulphide of.
Cinchona.
Cod-liver oil.
Conium.
Glycerine.
Hypophosphites.
Iodine.
Iron.
Mercury.
Nitric acid.
Phosphates.
Phosphoric acid.
Sarsaparilla.
Sodium, carbonate of.
Sulphides.

Scurvy—
Acids.
Alcohol.
Atropia.
Catechu.
Cinchona.
Diet.
Gallic acid.
Iron alum.
Iron, chloride of.
Lemon-juice.
Potassium, chlorate and bitartrate of.
Rhatany.
Tannic acid.
Vinegar.

Sea-sickness—
Amyl, nitrite of.
Brandy.
Chloral.
Chloroform.
Creasote.
Ice-bag, spinal.
(See Vomiting.)

Seborrhœa—
Alcohol.
Arsenic.
Cantharides.
Carbolic acid.
Cod-liver oil.
Corrosive sublimate.
Glycerine.
Green soap.
Iron.
Mercurial ointment.
Oils.
Tar.

Septicæmia. See Pyæmia.

Sick Headache—
Aconite.
Ammonium, chloride and valerianate of.
Amyl, nitrite of.
Antacids.
Chamomile.
Counter-irritation.
Croton chloral.
Friedrichshall water.
Galvanism.
Guarana.
Indian hemp.
Magnesia.
Mercurial pill.
Nux vomica.
Phosphorus.
Podophyllum.
Potassium, bromide [of.
Veratria.
Zinc, valerianate of.
(See Headache.)

Singultus—
Bromides.
Chloral.

Sleeplessness. See Insomnia.

Smallpox—
Actæa racemosa.
Carbolic acid.
Chloral (bath and wash).
Chlorine.
Cinchona.
Cold water.
Collodion.
Gutta percha.
Iodine.
Laxatives.
Lime liniment.
Mercurial ointment and plaster.
Opium.
Quinia.
Silver, nitrate of.
Soda, chlorinated.
Sponging.
Sulphurous acid.
Tannic acid.

Sore Mouth, Mercurial—
Belladonna.
Copper, sulphate of.
Oil of turpentine.
Opium.
Potassium, chlorate of.
Purgatives.
Tannic acid.

Sore Nipples. See Nipples.

Sores—
Alcohol.
Alum.
Calcium, carbonate and sulphide of.
Camphor.
Carbolic acid.
Charcoal.
Chlorine.
Cinchona.
Copper, sulphate of.
Iodoform.
Lead, acetate of.
Lime-water.
Morphia.
Nitric acid.
Opium.
Starch.
Starch, iodide of.
Tannic acid.
Yeast.
Zinc, oxide and sulphate of.
(See Ulcers.)

Sore Throat. See Laryngitis, Pharyngitis, etc.

Spasm—
- Amyl, nitrite of.
- Belladonna.
- Camphor.
- Chloral.
- Conium.
- Electricity.
- Iodine.
- Musk.
- Opium.
- Tobacco.
- (See Convulsions.)

Spermatorrhœa—
- Acetic acid.
- Aperients.
- Baths, chalybeate.
- Belladonna.
- Bromides.
- Calcium, hypophosphite of.
- Camphor.
- Cantharides.
- Chloral.
- Cinchona.
- Cold douche.
- Conium.
- Copaiba.
- Digitalis.
- Electricity.
- Ergot.
- Ice-bag, spinal.
- Iron.
- Lupulin.
- Nux vomica.
- Oil of turpentine.
- Phosphorus.
- Quinia.
- Salt water sponge bath.
- Silver, nitrate of.
- Sodium, hypophosphite of.
- Sponging, cold.
- Strychnia.
- Tobacco.

Spinal Irritation—
- Aconite.
- Belladonna.
- Cod-liver oil.
- Electricity.
- Iron.
- Quinia.

Spleen, Enlarged—
- Bromides.
- Cinchona.
- Cold douche.
- Ergot.
- Iron.
- Lead.
- Mercury.
- Potassium, bromide of.
- Purgatives.
- Quinia.

Sprain—
- Camphor.
- Cold douche.
- Compression.
- Olive oil.
- (See Contusions.)

Stomach, Acute Inflammation of—
- Enemata.
- Fomentations.
- Ice.
- Opium.
- Silver, nitrate of.

Stomach, Chronic Inflammation of. See Dyspepsia, etc.

Stomatitis—
- Acids.
- Alum.
- Carbolic acid.
- Cinchona.
- Copper, sulphate of.
- Corrosive sublimate.
- Creasote.
- Glycerite of tannic acid.
- Iodine.
- Muriatic acid.
- Nitric acid.
- Potassium, chlorate and permanganate of.
- Salicylic acid.
- Silver, nitrate of.
- Soda, chlorinated.
- Sodium, carbonate of.
- Zinc, chloride of.

Strangury—
- Camphor.
- Citrates.
- Cotton.
- Erigeron.
- Indian hemp.
- Opium.
- Parsley.
- Potassa, solution of.
- Spirit of nitrous ether.
- Uva ursi.

Sunstroke—
Ammonia.
Atropia.
Brandy.
Cinchona.
Cold affusion.
Enemata, stimulant.
Friction with ice.
Iced water.
Mustard.
Opium.
Quinia.
Tea.
Whiskey.

Sweating, Excessive. See Perspiration.

Sycosis—
Acetic acid.
Arsenic.
Carbolic acid.
Cod-liver oil.
Corrosive sublimate.
Creasote.
Epilation.
Green soap.
Iron.
Mercury, nitrate of.
Oil.
Oleate of mercury.
Poultices.
Scarification.
Sodium, sulphite of.
Sulphur.
Sulphur, iodide of.
Sulphurous acid.
Tar.
White precipitate.

Syncope—
Ammonia.
Brandy.
Digitalis.
Ether.
Mustard.
Wine.

Synovitis—
Blisters.
Carbolic acid.
Iodine.
Oleate of mercury and morphia.

Syphilis—
Alkalies.
Baths (vapor, warm, Turkish).
Calomel.
Carbolic acid.
Carbon, bisulphide of.
Cauterization.
Chlorine.
Chromic acid.
Cod-liver oil.
Copper, sulphate of.
Corrosive sublimate.
Guaiac.
Hypodermic injections of mercury.
Inunction.
Iron, iodide of.
Mercurial fumigations.
Mercury.
Mezereon.
Muriatic acid.
Nitric acid.
Nitro-muriatic acid.
Oleate of mercury.
Opium.
Potassium, chlorate and iodide of.
Salicylic acid.
Sarsaparilla.
Silver, nitrate of.
Sodium, iodide of.
Sulphuric acid.
Sulphurous acid.
Zinc, chloride, iodide, and nitrate of.

Tabes Mesenterica—
Cinchona.
Cod-liver oil.
Frictions.
Hypophosphites.
Iron, ammonio-citrate of.
Potassium, iodide of.
Poultices.
Sea air.

Tænia—
Aloes.
Brayera.
Calomel.
Castor oil.
Chenopodium.
Croton oil.
Enemata.
Ether.
Filix mas.
Iron.
Kameela.
Kousso.
Mineral acids.
Mucuna.
Oil of turpentine.
Olive oil.
Pepo.
Picric acid.
Pomegranate.
Purgatives.
Quassia.
Santonin.
Spigelia.
Sulphuric acid.
Tansy.
Tin.
(See Worms.)

Testicle, Swelled—
Chloroform.
Collodion.
Copaiba.
Strapping.

Tetanus—
Aconite.
Alcohol.
Amyl, nitrite of.
Atropia.
Baths (warm, vapor, etc.).
Belladonna.
Calabar bean.
Cannabis.
Cantharides.
Chloral.
Chloroform.
Cinchona.
Conia.
Curare.
Electricity.
Ether.
Hemp.
Ice-bag, spinal.
Jaborandi.
Magnesium, sulphite of.
Morphia.
Nicotia.
Nux vomica.
Oxygen.
Physostigma.
Potassium, bromide of.
Purgatives.
Quinia.
Sodium, sulphite of.
Stimulants.
Tartar emetic.
Tobacco.
Wines.

Thrush—
Borax.
Catechu.
Copper, sulphate of.
Glycerine.
Sodium, sulphite of.
Sulphurous acid.

Tic Douleureux. See Neuralgia.

Tinea Favosa—
Corrosive sublimate.
Cod-liver oil.
Epilation.
Mercury, yellow sulphate of.
Oils.
Sodium, sulphite of.
Sulphur.
Sulphurous acid.
Tar.
(See Aphthæ.)

Tinea Sycosis. See Tinea favosa.

Tinea Tonsurans—
Iodine.
Mercury.
Oils.
Potassium, sulphide and sulphocyanide of.
Silver, nitrate of.
Sodium, sulphite of.
Sulphur.
Sulphurous acid.
Tar.
(See Sycosis.)

Tinea Versicolor—
Arsenic.
Calcium, sulphide of.
Corrosive sublimate.
Iron.
Sodium, carbonate and sulphite of.
Soft soap.

Tonsillitis—
Alum.
Ammonia, solution of.
Belladonna.
Capsicum.
Chloral.
Cinchona.
Cold.
Fomentations.
Inhalations, atomized.
Lead.
Opium.
Poultices.
Purgatives.
Quinia.
Silver, nitrate of.
Tartar emetic.
(See Pharyngitis.)

Toothache—
Aconite.
Alum.
Blisters.
Camphor.
Caraway.
Cloves.
Conium.
Creasote.
Oil of cajeput.
Opium.

Trichiniasis—
Benzole.
Iron.
Picric acid.
Purgatives.
Quinia.
Sodium, sulphocarbolate of.
Stimulants.

Trismus Nascentium. See Tetanus.

Tuberculosis. See Phthisis, etc.

Tympanitis—
Assafœtida.
Bismuth.
Oil of turpentine.
Opium.

Typhoid Fever—
Alcohol.
Alum.
Ammonium, acetate of.
Bath, warm.
Belladonna.
Bismuth.
Blisters.
Brandy.
Calomel.
Cinchona.
Cold affusion.
Copper, sulphate of.
Corrosive sublimate.
Digitalis.
Enemata.
Ergot.
Fomentations.
Ice.
Iodine.
Ipecacuanha.
Lead, acetate of.
Mercury.
Muriatic acid.
Oil of turpentine.
Opium.
Poultices.
Quinia.
Salicin.
Salicylic acid.
Serpentaria.
Silver, nitrate of.
Soda, chlorinated.
Sodium, salicylate and sulphite of.
Sponging.
Sulphurous acid.
Veratrum viride.
Wine.
Zinc, phosphide and sulphate of.
(See Fever.)

Typhus Fever—
Alcohol.
Bath, warm.
Belladonna.
Brandy.
Camphor.
Carbolic acid.
Chloral.
Chlorine water.
Cinchona.
Cold affusion.
Digitalis.
Hyoscyamus.
Ipecacuanha.
Muriatic acid.
Mustard.
Nitric acid.
Opium.
Phosphoric acid.
Quinia.
Sodium, sulphite of.
Sponging.
Sulphuric acid.
Wine.
(See Fever.)

Ulcers—
Alcohol.
Alum.
Bismuth.
Camphor.
Carbolic acid.
Carbon, sulphide of.
Chalk.
Charcoal.
Chloral.
Cinchona.
Collodion.
Conium.
Copaiba.
Copper, sulphate of.
Creasote.
Glycerine.
Iodoform.
Iron.
Lead.
Lime, chlorinated.
Lime-water.
Mercury.
Nitric acid.
Opium.
Potassium, chlorate and permanganate of.
Salicylic acid.
Silver, nitrate of.
Soda, chlorinated.
Sugar.
Sulphuric acid.
Tar.
Zinc, chloride, oxide, and sulphate of.

Uræmia—
Arsenic.
Baths, hot air.
Benzoic acid.
Chloral.
Chloroform.
Colchicum.

Uræmia—*continued.*

Digitalis.
Elaterium.
Enemata, antispasmodic.
Iron.
Iron and quinia, citrate of.
Non-nitrogenous diet.
Opium.
Potassium, acetate of.
Purgatives.
Sodium, phosphate of.
Sponging, tepid.

Urethritis—

Belladonna.
Copaiba.
Demulcents.
Fomentations.
Hip-bath, hot.
Opium.
Silver, nitrate of.
(See Gonorrhœa.)

Uric Acid Diathesis—

Ammonium, phosphate of.
Benzoic acid.
Benzoin.
Diluents.
Laxatives.
Lithium, benzoate of.
Potassa, solution of.
Potassium, salts of.
Vegetable diet.

Urticaria—

Aconite.
Alkalies.
Arsenic.
Baths (tepid, Turkish, etc.).
Benzoin.
Bismuth.
Chloroform.
Cod-liver oil.
Colchicum.
Corrosive sublimate.
Creasote.
Emetics.
Ipecacuanha.
Iron.
Lead lotions.
Nitric acid.
Potassium, cyanide of.
Purgatives, saline.
Quinia.
Vinegar.

Uterus, Fibroid Tumors of—

Ergot.

Uterus, Inertia of—

Belladonna.
Borax.
Cotton.
Electricity.
Ergot.
Hemp.
Oil of turpentine.
Uva ursi.

Uterus, Inflammation of. See Metritis.

Uterus, Rigidity of—

Belladonna.
Chloroform.
Tartar emetic.

Vaginismus—

Iodoform.
Silver, nitrate of.

Vaginitis—

Alum.
Fomentations.
Glycerite of tannic acid.
Hip-baths, hot.
Injections.
Poultices.
Purgatives.
Silver, nitrate of.
Vaginal suppositories (acetate of lead, belladonna, opium, oxide of zinc, etc.).

Vomiting—

Acids.
Alum.
Arsenic.
Belladonna.
Bismuth.
Blisters.
Calomel.
Carbolic acid.
Carbonic acid water.
Cerium, oxalate of.
Chloroform.
Counter-irritation.
Creasote.
Gelatin.
Hydrocyanic acid.
Ice.
Ice-bag.
Ipecacuanha.

Vomiting—*continued.*

Lime-water.
Magnesia.
Mercury with chalk.
Morphia.
Nux vomica.
Opium.
Potassium, bromide
Quinia. [of.
Quinia, bromhydrate
of. [of.
Sodium, bicarbonate
Veratrum album.

Vomiting of Pregnancy—

Aconite.
Alcohol.
Atropia.
Belladonna.
Bismuth.
Blisters.
Brandy.
Calcium, acid syrup of
hypophosphite of.
Calcium, hydrated
phosphate of.
Carbonic acid water.
Cardamom.
Cerium, oxalate of.
Chloral.
Dilatation of cervix.
Electricity.
Gentian.
Hyoscyamus.
Iodine.
Ipecacuanha.
Morphia.
Muriatic acid.
Nitric acid.
Nitromuriatic acid.
Nux vomica.
Pessary.
Phosphoric acid. [of.
Potassium, bromide
Pyroxylic spirit.
Silver, nitrate of.
Suppositories, vaginal.
(See Vomiting.)

Vulvitis—

Alum.
Aperients.
Atropia.
Belladonna.
Glycerine. [acid.
Glycerite of tannic
Hip bath, warm.
Hydrocyanic acid.
Lead, acetate, iodide,
and subacetate of.
Lime-water.
Morphia.

Warts—

Acetic acid.
Ammonium, chloride
of.
Arsenic.
Caustic alkalies.
Chloral.
Chromic acid.
Creasote.
Iodine.
Mercury, nitrate of.
Muriatic acid.
Nitric acid.
Sanguinaria.
Savine.
Silver, nitrate of.
Zinc, chloride, iodide,
and nitrate of.

Whooping-cough—

Aconite.
Alum.
Ammonium, bromide,
carbonate, and
chloride of.
Arsenic.
Assafœtida.
Belladonna.
Bromides.
Camphor.
Carbolic acid.
Castanea.
Chloral.
Chlorine.
Chloroform.
Cinchona.
Cod-liver oil.
Conium.
Croton chloral.
Dracontium.
Dulcamara.
Emetics.
Ergot.
Ether.
Eucalyptus.
Expectorants, seda-
tive.
Hydrocyanic acid.
Indian hemp.
Ipecacuanha.
Iron.
Lead.
Lime-water.
Lobelia.
Morphia.
Musk.
Mustard.
Nitric acid.
Oil of turpentine.
Opium.
Potassium, bromide
and carbonate of.
Quinia.
Senega.
Silver, iodide and ni-
trate of.
Sponging, salt.
Squill.
Stramonium.
Tannic acid.
Tartar emetic.
Valerian.
Zinc, oxide, sulphate,
and valerianate of.

Worms—

Absinthium.
Alum.
Ammonium, chloride of.
Assafœtida.
Camphor.
Castor oil.
Chenopodium.
Cinchona.
Cod-liver oil.
Cold water.
Colocynth.
Creasote.
Enemata.
Ether.
Filix mas.
Gamboge.
Iron, tincture of chloride of.
Jalap.
Kameela.
Kousso.
Lime-water.
Mercury.
Muriatic acid.
Mucuna.
Nux vomica.
Oil of turpentine.
Pomegranate.
Pumpkin seeds.
Quassia.
Quinia.
Santonin.
Savine.
Scammony.
Sodium, chloride of.
Spigelia.
Tannic acid.
Tansy.
Tin.
Tobacco.
Tonics.
Valerian.
(See Tænia, Ascarides, etc.)

Wounds—

Alcohol.
Ammonium, chloride of.
Balsam of Peru.
Bath, Turkish.
Boracic acid.
Carbolic acid.
Chloral.
Cold.
Collodion.
Glycerine.
Opium.
Petroleum.
Salicylic acid.
Silver, nitrate of.
Sulphurous acid.
Tannic acid.

Yellow Fever—

Acids, mineral.
Bath, warm.
Chloroform.
Cinchona.
Cold.
Lead.
Mercury.
Morphia.
Mustard.
Oil of turpentine.
Purgatives.
Quinia.

CELEBRATED PRESCRIPTIONS OR REMEDIES.

Under this head will be included a brief reference to a number of well-known remedies, which have at different times enjoyed a reputation among professional men for their efficacy in the treatment of disease. Many of them are now but little employed, although they possess historic interest; others are of comparatively recent introduction. It is well for the practitioner at all times to scan closely the merits of any prescription or remedy bearing the name of an individual; but the possession of such a name should not necessarily be looked upon as an evidence of irregularity in its composition or as a bar to its introduction to or continuance in professional favor. Such names have been frequently appended by the pharmacist to perfectly legitimate formulæ or recipes merely to give them popularity, or to impart to them a distinctive character. Quite a number of them have been imitated in various pharmacopœias. The list might be amplified *ad infinitum.*

Abernethy's Aperient Mixture.—Sulphate of magnesia, ʒiv; Manna, ʒij, Infusion of senna, fʒvj; Tincture of senna, fʒij; Mint water, f℥j; Distilled water, f℥ij.

Abernethy's Pills.—Aloes, Extract of hyoscyamus, each gr. ij; Ipecac. gr. $\frac{5}{6}$; Pil. hydrarg. gr. j.

Adrian's Hæmostatic.—A solution of 15 grammes of chloride of sodium in 60 grammes of water, to which is added 25 grammes of solution of ferric chloride, sp. gr. 1.26.

Ague Drops, Tasteless.—A preparation of arsenic, at one time in vogue, which from its supposed beneficial effects, led to the introduction of "Fowler's Solution" by Dr. Fowler, of Stafford, England—the *Liquor Potassii Arsenitis* of the Ph. U. S.

Aikin's Ammonio-tartrate of Iron.—The ferric tartrate of iron has been so called because first employed in medicine by the late Dr. Aikin, of England.

Algaroth's Powder.—A white precipitate of oxychloride of antimony, formed when solution of terchloride of antimony is diluted with

water; so called after an Italian physician of the 16th century, who recommended its use as a medicine. The names *Angelic Powder* and *Mercury of Life* have also been given to it.

Anderson's Scots' Pills.—Compound pills of aloes, soap, colocynth, gamboge, and oil of aniseed.

Angelic Powder.—*See* Algaroth's Powder.

Aqua Binelli.—*See* Eau de Binelli.

Aqua Brocchieri.—*See* Eau de Binelli.

Asiatic Pills. *Tanjore Pills.*—These consist of arsenious acid 1 part, and black pepper 80 parts.

Atkinson's Depilatory.—1 part of orpiment and 6 parts of quicklime, with a little flour and some yellow coloring matter.

Aubergier's Syrup of Lactucarium.—Popular in Continental Europe. Its composition is probably lactucarium (German), granulated sugar, simple syrup, citric acid, orange-flower water, water, and diluted alcohol.

Balsamum Traumaticum.—A balsam of the older Pharmacopœias, represented in the Ph. U. S. by the Tinctura Benzoini Composita.

Basham's Mixture.—A tonic mixture, consisting of tincture of chloride of iron, dilute acetic acid, solution of acetate of ammonia, tincture of orange peel, and glycerine.

Bateman's Pectoral Drops.—A preparation of opium, of about the same strength as paregoric, and containing red saunders, alcohol, opium, catechu, camphor, and oil of anise, according to the formula of the Philadelphia College of Pharmacy, 1833.

Bates's Alum Water.—A compound solution of alum and sulphate of zinc in boiling water, once used as an injection, astringent wash, etc.

Battley's Sedative Solution of Opium, or Sedative Drops.—A solution of extract of opium ℥iij in hot water ℥xxx, filtered and mixed with alcohol ℥vj.

Becher, Tonic Pills of.—These consist of extract of hellebore, myrrh, and the leaves of centaurea benedicta.

Becquerel's Gout Pills.—Each pill contained quiniæ sulph. gr. iss, extract. digitalis gr. $\frac{3}{10}$, colchici semin. pulv. gr. $\frac{4}{5}$.

Beguin's Volatile Spirit of Sulphur.—See Boyle's Fuming Liquor.

Berthollet's Neutral Carbonate of Ammonia.—Bicarbonate of ammonium has been so called, having been first formed by the chemist Berthollet in 1807.

Bestucheff's Tincture.—An ethereal tincture of chloride of iron, consisting of 1 part of solution of ferric chloride, sp. gr. 1.482 (containing 43.5 per cent. Fe_2Cl_6) dissolved in 14 parts of spirit of ether.

Bibron's Antidote.—An antidote to the poison of the rattlesnake, composed of iodide of potassium, corrosive sublimate, bromine, and diluted alcohol.

Biette's Arsenical Solution.—Ammonii arseniat. gr. j, dissolved in water f℥j. Dose, ♏xx–xxx.

Binelli, Eau de.—*See* Eau de Binelli.

Blancard's Pills.—Same as Pilulæ Ferri Iodidi (Ph. U. S.).

Bland's Ferruginous Pills.—*See* Griffith's Pills.

Bontius's Pills.—These consisted of aloes, gamboge, gum ammoniacum, and white wine vinegar.

Borden's Extract of Beef.—A preparation of meat consisting exclusively of the soluble ingredients of the flesh, without common salt or other condiment, merely requiring hot water for solution.

Boudin's Solution.—Used in Continental Europe. It is an aqueous solution of arsenious acid, with the addition of white wine.

Boyle's Fuming Liquor of Sulphur.—A powerful oily liquor, obtained by distilling a mixture of sulphur, sal ammoniac, and lime, and chiefly used, at one time, as a sudorific internally, and an application to wounds and ulcers externally. Also called *Beguin's Volatile Spirit of Sulphur.*

Brandish's Alkaline Solution.—A strong alkaline mixture, once employed, made by adding together American pearlashes, quicklime, wood ashes, and water. It was stronger than the officinal liquor potassæ.

Brocchieri, Eau de.—*See* Eau de Binelli.

Brown-Sequard's Neuralgic Pills.—Extract of hyoscyamus, extract of conium, āā gr. $\frac{2}{3}$; Extract of opium, gr. ss; Extract of aconite, gr. $\frac{1}{3}$; Extract of cannabis indica, gr. $\frac{1}{4}$; Extract of stramonium, gr. $\frac{1}{5}$; Extract of belladonna, gr. $\frac{1}{6}$.

Burnett's Disinfecting Liquid.—A solution recommended for external use by Sir William Burnett, resembling the Liquor Zinci Chloridi (Ph. U. S.).

Canquoin, Paste of.—*See* Paste.

Carron Oil.—Linimentum calcis (Ph. U. S.) is frequently called Carron oil, because employed at the Carron Iron Works in cases of burns and scalds.

Carthusian Powder.—Kermes Mineral.

Castillon's Powder.—A powder used in summer diarrhœa, containing salt, tragacanth, sago, prepared oyster shell, and cochineal.

Caustique de Filhos.—*See* Vienna paste.

Chabert's Empyreumatic Oil.—A mixture of one part of empyreumatic oil of hartshorn, with three parts of oil of turpentine, afterwards distilled, at one time employed as an anæsthetic.

Chapman's Dinner Pills.—A favorite pill for habitual constipation, by the late Prof. N. Chapman, of Philadelphia, consisting of aloes and mastich, each gr. iss, ipecacuanha gr. i, and oil of caraway a trace.

Chemical Food.—*See* Parrish's Compound Syrup of Phosphates.

Churchill's Iodine Caustic.—Iodine, ℈j; Iodide of potassium, ℈ij; Water, f℥ss.

Churchill's Tincture of Iodine.—Iodine, ℥iiss; Iodide of potassium, ℥ss; Alcohol (75 per cent.), f℥xvj.

Clark's Dinner Pills.—Originally prescribed by Sir Chas. Clark, London, consisted of aloes, extract of chamomile, myrrh, rhubarb, and oil of chamomile.

Commander's Balsam.—Imitated in Tinctura Benzoini Composita, Ph. U. S.

Coxe's Hive Syrup.—Syrupus Scillæ Compositus of the Ph. U. S.

Dalby's Carminative.—A mixture of oil of peppermint, carbonate of magnesium, oils of nutmeg and aniseed, tinctures of castor, assafœtida, and opium, spirit of pennyroyal, compound tincture of cardamom, and peppermint water.

Decoction of Zittmann.—*See* Zittmann.

Derosne, Salt of, *Matter of Derosne.*—A name formerly given to narcotine.

Deshler's Salve.—The name by which Ceratum Resinæ Compositum (Ph. U. S.) is popularly known.

De Valangin's Solution.—A hydrochloric solution of arsenious acid introduced by Dr. De Valangin, a native of Switzerland, who died in London in 1805.

De Vigo's Powder.—Same as Hydrargyri Oxidum Rubrum of the Ph. U. S.

Dewees's Carminative.—Magnesii carb. ℥iss; Sacchar. ℥iij; Tinct. assafœtidæ, f℥iij; Tinct. opii, f℥j; Aquæ, Oiss.

Dewees's Emmenagogue Mixture.—Tincture of chloride of iron, f℥iij; Tinct. of cantharides, f℥j; Tinct. of aloes, f℥ss; Ammoniated tincture of guaiacum, f℥iss; Syrup, q. s. ad f℥vj. Dose, a tablespoonful.

Dippel's Animal Oil, *Empyreumatic Animal Oil.* A fetid volatile oil, obtained when animal substances, as bone or hartshorn, are subjected to destructive distillation.

Donovan's Solution.—Liquor Arsenici et Hydrargyri Iodidi (Ph. U. S.). Introduced into medical practice in 1839 by Dr. Donovan.

Dover's Powder.—The Pulvis Ipecacuanhæ Compositus (Ph. U. S.) is generally so called. Originally, however, as proposed by Dr. Dover, it consisted of opium, saltpetre, vitriolated tartar, ipecacuanha, and licorice.

Duke of Portland's Powder—*See* Portland Powder.

Eaton's Syrup.—A compound syrup of phosphates, sometimes prescribed under the name of *syrupus ferri, quiniæ et strychniæ phosphatis.*

Eau de Binelli.—*Aqua Binellii,* a celebrated hæmostatic, devised by Dr. F. Binelli towards the end of the last century, and still employed in Italian hospitals. It contains more than a score of ingredients.

Aqua Brocchieri, Eau de Brocchieri, was also much employed a few years ago, and is made by maceration and distillation from pine wood.

Eau de Pagliari, another popular styptic, is made of benzoin ℥viiss, sulphate of alumina and potassa ℥xv, water Oxss.

Eau de Javelle.—*See* Javelle's Water.

Eau Medicinale d'Husson.—A remedy for gout, which was considered to be composed of colchicum root ℥ij, macerated in sherry wine ℥viij.

Elixir Acidum Halleri.—A mixture made by dropping, with continued stirring, 1 part of pure sulphuric acid with 3 parts of alcohol.

Elixir Proprietatis Paracelsi.—Imitated in the Tinctura Aloes et Myrrhæ of the Ph. U. S. It was invented by Paracelsus.

Elixir Roborans Whyttii.—The Compound Tincture of Cinchona of the German Pharmacopœia was also called by this name.

Elixir Vitrioli Mynsichti, *Mynsicht's Elixir*, is the Acidum Sulphuricum Aromaticum of the Ph. U. S.

English Remedy.—*See* Jesuit's Powder.

Everitt's Salt.—The ferrocyanide of iron and potassium has been so called.

Febure's Remedy for Cancer.—This consisted of arsenious acid, distilled water, extract of conium, solution of subacetate of lead, and tincture of opium, used externally. Internally, he prescribed arsenious acid, rhubarb, syrup of chicory, syrup of poppies, and distilled water.

Fleming's Tincture of Aconite.—A stronger preparation than the officinal tincture, inasmuch as it contains 16 troy oz. of aconite to f℥xxiv of alcohol.

Fowler's Solution.—Liquor Potassii Arsenitis (Ph. U. S.). *See* Ague Drops.

Frere Come, Arsenical Paste of.—A paste named after the celebrated monk-surgeon, made by mixing water with a powder consisting of arsenious acid, red sulphuret of mercury, and powdered animal charcoal.

Friar's Balsam.—*See* Jesuit's Drops.

Glaser's Salt—Sulphate of potassium was at one time so called.

Glauber's Salt.—Sodii Sulphas (Ph. U. S.), discovered by the chemist Glauber in 1658.

Godfrey's Cordial.—A preparation of opium, at one time in vogue, made of carbonate of potassium, water, molasses, tincture of opium, alcohol, and oil of sassafras, each f℥j, containing nearly 1¼ gr. of opium.

Gondret's Ammoniacal Ointment, *Pommade de Gondret.*—A rubefacient and vesicant ointment suggested by Gondret, of Paris, in 1837, and made of hogs' lard, oil of sweet almonds, and strong liquid ammonia.

Goulard's Cerate.—A name formerly given to the Ceratum Plumbi Subacetatis of the Ph. U. S.

Goulard's Extract is the old name of Liquor Plumbi Subacetatis (Ph. U. S.). A dilution of this extract, 2 p. to 90 p. of water and 8 p. of alcohol, was called *Goulard's Lead Water*.

Goulard's Vegoto-Mineral Water, or Goulard Water.—A rather weak preparation of lead, of which the Liquor Plumbi Subacetatis Dilutus (Ph. U. S.) is said to be an imitation.

Granville's Counterirritants.—Two lotions were suggested by the late Dr. Granville:—a *stronger lotion*, composed of strong solution of ammonia f℥j, spirit of rosemary fʒiij, and tincture of camphor fʒij; and a *weaker lotion*, composed of strong solution of ammonia fʒx, spirit of rosemary f℥ss, and tincture of camphor fʒij.

Gregory's Mixture or Powder.—Rhubarb ℥ij, magnesia ℥vj, ginger ℥j.

Griffith's Mixture.—A mixture of myrrh, carbonate of potash, sulphate of iron, etc., suggested by Dr. Griffith, of England, in 1776, as a tonic and antihectic in pulmonary disease, hectic fevers, etc. It is imitated in the Mistura Ferri Composita of the Ph. U. S.

Griffith's Pills.—These were similar in composition to the Pilulæ Ferri Compositæ (Ph. U. S.). Similar pills, omitting the myrrh, are employed in Europe under the name of *Bland's Pills.*

Heberden's Ink.—A mixture of bitter tonics and aromatic stimulants with a small quantity of iron, so called from its black color.

Hiera Picra.—Pulvis Aloës et Canellæ (Ph. U. S.).

Hoffman's Balsam of Life.—This was composed of the oils of lavender, cloves, nutmegs, and cinnamon, āā ℈j, purified oil of amber gtt. x, balsam of Peru ʒss, rectified spirit colored with alkanet root ℥x.

Hoffman's Anodyne, *Hoffman's Mineral Anodyne Liquor.*—Spiritus Ætheris Compositus (Ph. U. S.), composed of ether, etherial oil, and alcohol, is an imitation of a solution made by the celebrated Hoffman in 1732.

Hoffman's Pills.—These pills consisted of corrosive sublimate gr. $\frac{1}{8}$, with distilled water, and bread crumbs to make a pill.

Hooper's Female Pills—Compound pills of aloes, dried or crystallized sulphate of iron, extract of hellebore, myrrh, soap, canella, and ginger.

Hope's Mixture.—A mixture of nitrous acid, tincture of opium, and camphor water, used in dysentery, diarrhœa, etc.

Husson, Eau Medicinale de.—*See* Eau Médicinale.

Huxham's Tincture of Bark.—Tinctura Cinchonæ Composita (Ph. U. S.) is an imitation and also an improvement on the formula of the celebrated English physician.

Jackson's Pectoral Lozenges.—A favorite lozenge after a prescription of the late Prof. Samuel Jackson. Each lozenge contains ipecac. powdered gr. $\frac{1}{20}$, sulphuretted antimony gr. $\frac{1}{40}$, muriate of morphia gr. $\frac{1}{33}$, gum arabic, sugar, and powdered extract of liquorice, each gr. 3.3, tincture of tolu gr. $1\frac{1}{5}$, and oil of sassafras gtt. $\frac{1}{50}$.

Jackson's Ammonia Lozenges contain in each muriate of ammonia gr. ss, muriate of morphia gr. $\frac{1}{60}$, powdered elm bark gr. ij, powdered gum arabic, powdered sugar, powdered extract of liquorice, each gr. ij$\frac{1}{3}$, tincture of tolu gtt. j, oil of partridge-berry gtt. $\frac{1}{15}$.

Jackson's Pectoral Syrup.—A prescription of the late Prof. Samuel Jackson, consisting of sassafras pith ʒj, sugar lb. $1\frac{3}{4}$, gum arabic ℥j, muriate of morphia gr. viij, water Oj. Teaspoonful a dose.

James's Powder—A powder, patented by Dr. James, of England, in the 18th century, which was imitated in the Ph. U. S. under the name Pulvis Antimonialis.

Javelle's Water. *Eau de Javelle.*—A solution prepared from carbonate of potassium in the same way that solution of chlorinated soda is prepared from carbonate of sodium.

Jesuit's Drops.—Sometimes called Friar's Balsam, Wound Balsam, Balsamum Traumaticum, etc. This is the Tinctura Benzoini Composita (Ph. B.).

Jesuit's Powder. *Jesuit's Bark.*—A synonym for powdered cinchona or bark, because one of the most active agents in its introduction was the Cardinal de Lugo. It fell into disuse, but was revived by Sir Robert Talbor; hence it was called *Talbor's Powder* or the *English Remedy.*

Kentish Liniment.—The old name of a liniment of which Linimentum Terebinthinæ (Ph. U. S.) is an imitation.

Kirkland's Neutral Cerate.—A dressing to indolent ulcers, which was afterwards imitated in the Unguentum Plumbi Compositum (Ph. B.), and composed of prepared chalk, distilled vinegar, and lead plaster.

Labarraque's Solution, *Labarraque's Soda Disinfecting Fluid.* Liquor Sodæ Chlorinatæ (Ph. U. S.).

Lady Crespigny's Dinner Pills.—*See* Lady Webster's Dinner Pills.

Lady Haskett's Dinner Pills.—*See* Lady Webster's Dinner Pills.

Lady Webster's Dinner Pills.—Pilulæ Aloes et Mastiches of the Ph. U. S. The Pilulæ Stomachicæ of the Paris Codex, edition of 1758. They have been called also *Lady Haskett's* and *Lady Crespigny's Dinner Pills.*

Lartique's Gout Pills.—These consist of compound extract of colocynth gr. iv, acetic extract of colchicum gr. $\frac{2}{5}$, extract of digitalis gr. $\frac{1}{5}$.

Ledoyen's Disinfecting Fluid.—A solution of nitrate of lead in water, formerly used as a disinfectant.

Liebig's Extract of Beef.—A concentrated preparation of meat, containing neither fat nor gelatin, and being rich in nitrogenous principles.

Lisbon Diet Drink.—A celebrated decoction, of which Decoctum Sarsaparillæ Compositum of the Ph. U. S. is an imitation.

Logan's Plaster.—Made of litharge, carbonate of lead, castile soap, fresh butter, olive oil, and mastic.

London Powder.—Same as Vienna Powder.

Lugol's Solution.—Liquor Iodinii Compositus (Ph. U. S.) is a substitute for that of Lugol, who proposed in a work translated into English, in 1831, several solutions of iodine; a concentrated solution of iodine in iodide of potassium, an ioduretted mineral water, and various caustic, rubefacient, and stimulant solutions.

Magendie's Solution of Morphia.—A solution of morphia prepared by dissolving 16 grains of sulphate of morphia in f℥j of water: the French solution, known as Magendie's, is not so strong, being prepared by dissolving 0.8 grain of acetate of morphia in 30 grains of water.

Maby's Plaster.—A plaster imitated in the Ph. U. S., 1830, in the plaster of the carbonate of lead, and consisting of carbonate of lead, olive oil, yellow wax, lead plaster, and Florentine orris.

Marseilles Vinegar.—*See* Thieves' Vinegar.

Marshall's Pills.—Each pill contains one grain each of compound extract of colocynth, blue mass, aloes, Castile soap, and rhubarb.

Martin's Cancer Powder.—A remedy for cancer, of which the chief ingredient was arsenious acid.

Martin's Hæmostatic.—Employed in France particularly, and consisting of selected pieces of spunk saturated with ferric chloride.

Matter of Derosne.—*See* Derosne.

Maynard's Adhesive Liquid.—Collodion was at first so called, after Mr. Maynard, who probably introduced it into surgical practice.

McMunn's Elixir.—A celebrated narcotic nostrum, in which opium was the active ingredient, the elixir being of about the strength of laudanum.

Mercury of Life.—*See* Algaroth's Powder.

Mettauer's Solution or Aperient.—A laxative infusion, consisting of Aloes Socot. ʒv; Sodii bicarb. ʒxj; Valerian contus. ℥j; Water, Oj; Comp. spirit of lavender, f ʒvj. Dose, a dessertspoonful or tablespoonful.

Mindererus, Solution of.—A solution of acetate of ammonia was first described by Boerhaave in 1732, and subsequently employed by Minderer or Mindererus, and hence called Spiritus Mindereri. It is officinal (Ph. U. S.), as Liquor Ammoniæ Acetatis.

Mitchell's Aperient Pills.—These contained aloes gr. j; rhubarb, gr. ij; calomel, gr. $\frac{1}{6}$; tartar emetic, gr. $\frac{1}{12}$.

Mitchell's Tonic Pills.—A favorite prescription of the late Prof. John K. Mitchell, of Philadelphia, consisting of extract of quassia gr. iij; extract of conium, gr. $\frac{1}{4}$; subcarbonate of iron, gr. $\frac{1}{4}$.

Monsel's Solution.—The Liquor Ferri Subsulphatis of the U. S. Ph.

Mutter's Aromatic Pills.—A prescription for gonorrhœa of the late Prof. Mütter, of Philadelphia, consisting of the oils of copaiva, cubebs, and turpentine, each ♏j; magnesia, gr. ij.

Mynsicht's Elixir.—*See* Elixir Vitrioli Mynsichti.

Norwood's Tincture.—A saturated tincture of Veratrum viride.

Otto's Emmenagogue Pills.—A prescription of the late Dr. J. C. Otto, consisting of dried sulphate of iron, gr. j$\frac{3}{5}$; aloes, gr. $\frac{2}{5}$; turpentine gr. j; oil of turpentine, gr. $\frac{1}{3}$.

Pagliari, Eau de.—*See* Eau de Binelli.

Parrish's Compound Syrup of Phosphates, *Chemical Food.*—An excellent tonic prepared by the late Prof. Edward Parrish, each teaspoonful of which contains about 2½ grs. of phosphate of calcium, gr. i of phosphate of iron, with fractions of a grain of phosphates of sodium and potassium, besides free phosphoric and hydrochloric acids.

Paste of Canquoin.—Chloride of zinc pencils, prepared by dissolving chloride of zinc in a small quantity of water, and adding, with continual trituration, an equal weight of flour.

Pearson's Arsenical Solution.—This has a place in the French Codex, and is made by dissolving 1 part of crystallized arseniate of sodium in 600 parts of distilled water.

Physick's Medicated Lye.—An alkaline solution, made by digesting hickory ashes and soot in water for 24 hours; recommended by the late Dr. P. S. Physick for dyspepsia.

Pierlot's Solution.—When valerianate of ammonium was first introduced as a medicine, M. Pierlot, of Paris, made a solution of uniform strength, which received his name.

Plummer's Pills.—Pilulæ Antimonii Compositæ of the Ph. U. S.

Plunket's Caustic.—At one time a well-known remedy for cancer, consi ting of ranunculus acris and ranunculus flammula, arsenious acid, and sulphur, in yolk of egg.

Pommade de Gondret.—*See* Goudret.

Portland Powder.—A celebrated remedy for gout, consisting of the roots of aristolochia rotunda and gentiana lutea, the tops and leaves of teucrium chamædrys, and erythræa centaurium, and the leaves of ajuga chamæpitys. The same, or a similar mixture of powders was known to Cœlius Aurelianus.

Quaker's Black Drop.—A celebrated quack medicine of former times, for which Acetum Opii (Ph. U. S.) is an officinal substitute. It was also called the Lancaster Black Drop.

Quevenne's Iron.—The powder of iron reduced by hydrogen from the oxide, was first described by Quevenne; hence the name so often applied to it. It is the Ferrum Redactum of the Ph. U. S.

Radcliff's Elixir.—A purgative combination of aloes, cinnamon, zedoary, rhubarb, cochineal, syrup of buckthorn, and spirit and water as the solvents, which at one time had a great reputation.

Recamier's Caustic.—Chloride of gold gr. vj dissolved in aqua regia f℥j.

Rousseau's Laudanum.—A tincture of opium made with very weak alcohol; composed of white honey, water, opium, and alcohol.

Rufus's Pills.—A name formerly given to the Pilulæ Aloës et Myrrhæ (Ph. U. S.).

Sacred Elixir.—An old name for Tinctura Rhei et Aloës (Ph. U. S. 1850).

St. John Long's Liniment.—A liniment popularly known by this name consisted of oil of turpentine and acetic acid held in suspension by yolk of egg.

Sal Digestivum Sylvii.—A name formerly given to chloride of potassium.

Sal Polychrestus Glaseri.—An old preparation of sulphate of potassa with sulphur, at one time officinal in the Edinburgh Pharmacopœia.

Sal Sedativus Hombergi.—A name formerly given to boric or boracic acid.

Salt of Derosne.—*See* Derosne.

Seigrette Salt.—A name formerly given to Rochelle Salts, Potassii et Sodii Tartras of the Ph. U. S.

Scudamore's Mixture.—Once a popular remedy for the gout, consisting of sulphate of magnesium, mint water, vinegar of colchicum, syrup of saffron, and magnesia.

Sels de Boutigny.—Iodide of calomel, proposed by M. Boutigny in 1847 for use in syphilitic, scrofulous, and cancerous affections.

Spitta's Lozenges.—An imitation of these lozenges is officinal in the Ph. U. S. under the name Trochisci Cubebæ.

Stahl's Aperient Pills.—These consisted of powdered aloes, compound extract of colocynth, iron filings, and mucilage of gum arabic.

Sydenham's Laudanum.—Named after the celebrated English physician; now known as Acetum Opii (Ph. U. S.).

Syrup of Cuisinier. *Sirop de Cuisinier.*—A celebrated French syrup, represented in the Ph. U. S. of 1820 in the formula for Syrupus Sarsaparillæ.

Talbor's Remedy.—*See* Jesuit's Pills.

Tanjore Pills.—*See* Asiatic Pills.

Thieves' Vinegar.—Sometimes called *Marseilles vinegar* or *Vinegar of the Four Thieves*, once supposed to be a prophylactic against the plague and other contagious diseases. It was imitated in the Acidum Aceticum Aromaticum (Ph. E.).

Tully's Powder.—Various formulæ have been given, but the following is probably correct: sulphate of morphia 1 part, powdered camphor, powdered liquorice root, English precipitated chalk, of each 20 parts.

Turlington's Balsam.—The formula adopted by the Philadelphia College of Pharmacy includes alcohol, benzoin, liquid storax, Socotrine aloes, Peruvian balsam, myrrh, angelica root, balsam of tolu, and extract of liquorice root.

Turner's Cerate.—Formerly officinal (Ph. U. S.) as Ceratum Calaminæ.

Vallet's Pills.—Pilulæ Ferri Carbonatis of the Ph. U. S.

Vienna Caustic or Vienna Powder.—Officinal (Ph. U. S.) as Potassa cum Calce. A stronger preparation, known in France as *Caustique de Filhos*, is made by fusing 100 parts of caustic potassa, adding thereto 10 parts of powdered burned lime, and pouring the mass into lead tubes of suitable size to harden.

Vienna Draught.—This is the Infusum Sennæ Compositum of the German Pharmacopœia, and contains senna, water, tartrate of sodium and potassium, and manna.

Vigo's Plaster.—A mercurial plaster of the French Codex, containing turpentine and gum resins.

Vinegar of Four Thieves.—*See* Thieves' Vinegar.

Ward's Paste.—The *London Pharmacopœia* gave the following recipe for this well-known remedy for piles: black pepper and elecampane ℥j of each, fennel seeds ℥iij, honey and sugar ℥ij each. Dose ʒj-ij.

Warner's Cordial.—A laxative preparation for which Tinctura Rhei et Sennæ (Ph. U. S.) is a substitute.

Wistar's Cough Lozenges.—A form of lozenge long popular, in Philadelphia especially, the Trochisci Glycyrrhizæ et Opii of the Ph. U. S.

Zittmann's Decoction.—A preparation of Sarsaparilla, popular in Germany, especially in obstinate ulcerative affections. The formula of the German Pharmacopœia is generally adopted. The *stronger decoction* is made as follows: sarsaparilla ℥ xij, spring water ℔ lxxij. Digest for 24 hours; then introduce, enclosed in a small bag, ℥ iss of sugar of alum (powdered alum and whitest sugar, equal parts), ℥ ss of calomel, and ʒ j of cinnabar. Boil to ℔ xxiv, and near the end of boiling add ℥ ss each of aniseed and fennel seed, ℥ iij of senna, and ℥ iss of liquorice root, and put aside the liquor.

The *weak decoction* is made by adding to the residue ℥ vj of sarsaparilla and ℔ lxxij of water. Boil to ℔ xxiv, and near the end add lemon peel, cinnamon, cardamom, and liquorice, of each ʒ iij. Strain and set aside the liquor. The decoction may be drunk freely. It should not be prepared in metallic vessels.

SELECTED PRESCRIPTIONS FROM PRACTITIONERS' CASE-BOOKS.

In illustration of the general principles already laid down as to the doses of medicines, and in continuation of the subject of the applicability of remedial agents to a multitude of morbid conditions, the following prescriptions, culled from an immense mass of such material kindly placed at the disposal of the author, will doubtless prove of practical service. Being the fresh and very recent formulæ employed by leading medical men in active professional practice, whose daily experience is but a reflexion and counterpart of that of every other busy practitioner in all portions of the country, such prescriptions offer at once desirable methods of combining reliable medicines and indicate some of the applications of the more modern remedies. They may also, in some instances, by suggesting new trains of thought, aid to lift the mere routinist above the level of a blind adherence to fixed modes of prescribing and dispensing medicines. It is desirable, indeed, that even with the formulæ now offered, the practitioner should intelligently appreciate the motives for making such combinations of various agents in the same prescription, and under no other circumstances adopt any of them in his own practice. No attempt has been made to give anything like completeness to this merely illustrative collection of scattered formulæ.

Alopecia.

1.

℞. Olei ricini, fʒvj ;
Aquæ ammoniæ, fʒj ;
Tincturæ cantharidis, f℥ss ;
Aquæ Cologniensis, f℥ij ;
Aquam ad f℥v. M.
S. Apply as a wash.

2.

℞. Tincturæ cantharidis. fʒij–iv ;
Spiritûs ammoniæ aromatici, fʒxv ;
Glycerinæ, f℥j ;
Aquæ rosmarini destillatæ, f℥xx. M.
S. Apply as a wash.

Anæmia, Chlorosis, etc.

3.

℞. Ferri et ammonii citratis, gr. xxx ;
Tincturæ calumbæ,
" nucis vomicæ, āā gtt. xxx ;
Sacchari albi, ʒiij ;
Aquæ, f℥iij. M.
S. A teaspoonful three times a day.
(Tonic for a child 2 years of age.)

4.

℞. Ferri pyrophosphatis,
Quiniæ sulphatis, āā ʒj ;
Strychniæ, gr. j ;
Acidi phosphorici diluti, fʒj ;
Syrupi zingiberis, q. s. ;
Aquam ad f℥iv. M.
S. A teaspoonful three times daily.

5.

℞. Hydrargyri chloridi corrosivi, gr. j ;
Liquoris arsenici chloridi, fʒj ;
Tincturæ ferri chloridi,
Acidi hydrochlorici diluti, āā fʒiv ;
Syrupi zingiberis, f℥iiss ;
Aquam ad f℥vj. M.
S. A dessertspoonful, in water, after each meal.

6.

℞. Ferri pulveris,
Quiniæ sulphatis, āā gr. xxv ;
Acidi arseniosi, gr. j. M.
Divid. in pilulas xxv.
S. One three times a day.

7.

℞. Strychniæ sulphatis, gr. ss–j ;
Tincturæ ferri chloridi, fʒiij ;
Acidi acetici diluti, fʒiv ;
Liquoris ammonii acetatis, f℥iiiss ;
Syrupi,
Curaçoa, āā f℥j ;
Aquam ad f℥x. M.
S. A tablespoonful, in water, three times a day.

8.

℞. Quiniæ sulphatis, ʒj ;
Ferri sulphatis, gr. xlv ;
Strychniæ, gr. j ;
Acidi arseniosi, gr. iss. M.
Divid. in pilulas xxx.
S. One before each meal.

9.

℞. Ferri carbonatis, ʒj ;
Quiniæ sulphatis, gr. xxx ;
Strychniæ, gr. ss. M.
Divid. in pilulas xxx.
S. One three times daily.

10.

℞. Tincturæ cinchonæ compositæ, f℥iiss ;
" nucis vomicæ, f℥iss ;
Curaçoa, f℥ij ;
Acidi phosphorici diluti, f℥iij. M.
S. A dessertspoonful, in solution, after each meal.

Asthma.

11.

℞. Ætheris, f℥iss ;
Tincturæ lobeliæ, f℥j ;
" opii,
" stramonii, āā f℥ss. M.
S. A teaspoonful every hour or two until nausea results.

12.

℞. Potassii iodidi, gr. xxx ;
Spiritûs ammoniæ aromatici, f℥v ;
Tincturæ belladonnæ, f℥j ;
" cinchonæ compositæ, f℥j ;
Aquam menthæ piperitæ ad f℥xij. M.
S. A wineglassful three times a day.

Bronchitis.

13.

℞. Spiritûs chloroformi, f℥ss ;
Acidi hydrobromici dilut. f℥vj ;
Syrupi scillæ, f℥iss ;
Aquam ad f℥vj. M.
S. A tablespoonful as directed.
A sedative cough-mixture.)

14.

℞. Morphiæ sulphatis, gr. ij-ij ;
Acidi sulphurici, gtt. ij-ij ;
M. et adde—
Tincturæ serpentariæ, f℥j ;
Vini antimonii,
" ipecacuanhæ, āā f℥ij ;
Tincturæ anisi, f℥j ;
Syrupi pruni Virginianæ, f℥iv. M.
S. A teaspoonful *pro re natâ.*

15.

℞. Morphiæ acetatis, gr. ij ;
Tincturæ sanguinariæ, f℥ij ;
Vini ipecacuanhæ,
Extracti pruni Virginianæ fluidi, āā f℥ss ;
Syrupi senegæ,
" tolutani, āā f℥iss. M.
S. A tablespoonful every four hours.

16.

℞. Potassii chloratis, gr. xl ;
Acidi sulphurici aromatici, ♏xxx ;
Syrupi scillæ,
" pruni Virginianæ, āā f℥ss ;
Aquæ, f℥iss. M.
S. A teaspoonful every two or three hours.

17.

℞. Antimonii et potassii tartratis, gr. ss ;
Acaciæ pulveris, ℥ij ;
Liquoris morphiæ sulphatis,
Syrupi senegæ,
" aurantii corticis, āā f℥ss ;
Aquæ, f℥iv. M.
S. A tablespoonful three or four times daily.

18.

℞. Tincturæ lobeliæ, f℥ss;
  " opii camphoratæ, fʒvj;
 Syrupi scillæ, f℥iss;
  " ipecacuanhæ, fʒij;
 Acaciæ, ʒj. M.
 S. A teaspoonful every three or four hours.

19.

℞. Morphiæ acetatis, gr. viij;
 Potassii cyanidi, gr. $\frac{1}{4}$;
 Extracti pruni Virginianæ, f℥vj;
 Syrupi tolutani, f℥ij. M.
 S. A teaspoonful when cough is troublesome.
 (An excellent sedative mixture.)

20.

℞. Ammonii chloridi, ʒij;
 Extracti glycyrrhizæ, ʒj;
 Aceti opii, fʒj;
 Syrupi aurantii, f℥ij;
 Aquæ destillatæ, f℥iv. M.
 S. A tablespoonful three or four times a day.

Burns.

21.

℞. Iodoformi, ʒij;
 Unguenti cetacei, ℥j;
 Extracti conii, ʒiss;
 Acidi carbolici, ♏x. M.
 S. Apply to the affected surface.

22.

℞. Liquoris calcis,
 Glycerinæ, āā f℥j;
 Olei amygdalæ, f℥ij. M.
 S. Apply locally.

Chaps.

23.

℞. Zinci oxidi, gr. xl;
 Acidi tannici, gr. xxx;
 Glycerinæ, f℥ij;
 Tincturæ benzoini, fʒj;
 Camphoræ, gr. xxx. M.
 S. Apply to the affected part.

Chilblains.

24.

℞. Acidi carbolici, gr. iv;
 Glycerinæ, fʒiss;
 Alcoholis (85°), q. s. ad f℥vj. M.
 S. Apply locally.

25.

℞. Cerati simplicis,
 Olei olivæ, āā f℥ij;
 Glycerinæ, fʒij;
 Spiritûs camphoræ, fʒj. M.
 S. Apply locally.

Cholera Infantum.

26.

℞. Acidi sulphurici aromatici, ♏x;
 Extracti hæmatoxyli, gr. xv;
 Curaçoa, fʒj;
 Syrupi, fʒxj. M.
 S. A teaspoonful every one, two, or three hours, for a child two years old.

(See Diarrhœa, etc.)

Cholera Morbus.

27.

℞. Chloroformi,
Tincturæ opii,
" camphoræ,
Spiritûs ammoniæ aromatici, āā f ʒij ;
Olei cinnamomi, ♏j ;
Spiritûs vini Gallici, f ʒiss. M.
S. Half a teaspoonful as required. (See also Diarrhœa, etc.)

28.

℞. Hydrargyri chloridi mitis,
Opii, āā gr. ij. M.
Divid. in pilulas iv.
After pain is over,
℞. Olei olivæ, ℥j ;
Opii, gr. ij ;
Acaciæ, ℥ss ;
Syrupi pruni Virginianæ, f ℥j ;
Aquæ, f ℥iv. M.
S. A tablespoonful every two hours.

Colic, Cramps, etc.

29.

℞. Chloroformi,
Tincturæ opii,
" camphoræ,
Spiritûs ammoniæ aromatici, āā f ʒiij ;
Olei cinnamomi, ♏ iij ;
Spiritûs vini Gallici, f ℥ss. M.
S. Half a teaspoonful or more as required.

30.

℞. Morphiæ sulphatis, gr. j ;
Chloroformi, f ʒij ;
Syrupi zingiberis, f ℥ij. M.
S. A teaspoonful every five minutes until relieved.

31.

℞. Aquæ camphoræ, f ℥j ;
Spiritûs ætheris compositi, f ʒij ;
Tincturæ cardamomi compositæ, f ℥ss ;
Spiritûs anisi, f ʒvj ;
Olei carui, ♏xij ;
Syrupi zingiberis, f ʒij ;
Aquæ menthæ piperitæ, f ℥vss. M.
S. Half a wineglassful *pro re natâ.*

32.

℞. Spiritûs ætheris,
" chloroformi, āā f ʒiij ;
Tincturæ cardamomi compositæ, f ʒvj ;
Spiritûs myristicæ, f ʒij ;
Olei carui, ♏ xij ;
Mucilaginis tragacanthæ, f ℥iij;
Aquam menthæ piperitæ ad f ℥viij. M.
S. Half a wineglassful as required.

Constipation.

33.

℞. Sodii et potassii tartratis, ʒiiss ;
Sacchari albi, ʒv ;
Sodii bicarbonatis,
Acidi tartarici, āā ʒj ,
Olei limonis, q. s. M.
S. A teaspoonful in sweetened water.

34.

℞. Resinæ podophylli, gr. ij ;
Extracti hyoscyami,
Saponis Castiliensis, āā gr. viij. M.
Divid. in pilulas xxiv.
S. One at night.

35.

℞. Sennæ pulveris,
Extracti glycyrrhizæ, āā ℥ss;
Fœniculi seminis,
Sulphuris præcipitati, āā ʒij;
Sacchari albi, ℥iss. M.
S. One or two teaspoonfuls at bedtime.

(The pulvis glycyrrhizæ compositus, compound licorice powder, of the Prussian Pharmacopœia.)

36.

℞. Ferri sulphatis, ʒiij;
Aloës pulveris, ʒij;
Zingiberis pulveris, ʒiiss;
Extracti nucis vomicæ, gr. xl;
Confectionis rosæ, q. s. M.
Divid. in pilulas cxx.
S. One three times a day.

37.

R. Podophyllini, gr. ij;
Aloës Socotrinæ,
Extracti nucis vomicæ,
āā gr. xij;
Ferri sulphatis exsiccati,
gr. xxx. M.
Divid. in pilulas xxiv.
S. One three times a day.

38.

R. Aloës Socotrinæ,
Gambogiæ,
Hydrargyri chloridi mitis,
āā gr. xv;
Extracti taraxaci, q. s. M.
Divid. in pilulas xv.

Diarrhœa.

39.

℞. Acidi sulphurici aromatici,
Tincturæ capsici, āā gtt. xxx;
" opii,
" camphoræ, āā fʒj;
" zingiberis, fʒij;
" cardamomi compositæ, fʒx. M.
S. A teaspoonful in a tablespoonful of water every hour, or oftener if necessary.

Useful to travellers as a preventive of diarrhœa from change of water, etc.

40.

℞. Olei ricini, ♏xxiv;
Spiritûs chloroformi, fʒiss;
Liquoris morphiæ sulphatis,
fʒj;
Acaciæ pulveris, ʒiiss;
Syrupi, f℥ss;
Aquam ad f℥iv. M.
S. A small dessertspoonful every hour and a half until the bowels are quieted.

41.

℞. Sodii bicarbonatis, ʒj;
Tincturæ cardamomi compositæ, f℥j;
" camphoræ,
" opii, āā f℥ss;
Syrupi rhei aromatici, f℥ss;
Aquam menthæ piperitæ ad
f℥iv. M.
S. A teaspoonful three or four times a day.

42.

℞. Acidi sulphurici aromatici, f℈ij;
Extracti hæmatoxyli, ℈ij;
Tincturæ opii camphoratæ, f℥ss;
Syrupi zingiberis, q. s. ad f℥vj. M.
S. A tablespoonful as directed.

Diarrhœa (of Infants).

43.

℞. Bismuthi subcarbonatis, gr. xx;
Cretæ præparatæ, ℈j;
Spiritûs lavandulæ compositi, f℈ij;
Tincturæ opii, ♏vj;
" kino, ♏xxiv;
Acaciæ pulveris, ℈j;
Aquæ, f℈vj;
Syrupi, f℥ij. M.
S. A teaspoonful every hour, or three or four hours, for a child of one year.

44.

℞. Magnesii sulphatis, ℈j;
Tincturæ opii deodoratæ, gtt. xij;
Syrupi, f℥ss;
Aquæ menthæ piperitæ, f℥iiss. M.
S. A teaspoonful every two or three hours for a child one or two years of age.

45.

℞. Extracti hæmatoxyli, gr. vj;
Cretæ precipitatæ, gr. xij;
Syrupi acaciæ, f℥ss;
Tincturæ opii camphoratæ, gtt. xij;
Aquæ fœniculi, f℥ij. M.
S. A teaspoonful every three hours for a very young child.

46.

℞. Misturæ cretæ, f℥iij;
Tincturæ krameriæ, f℈j. M.
S. A teaspoonful after each loose evacuation, or three or four times daily.

47.

℞. Creasoti, gtt. ij;
Acidi acetici diluti, ♏xij;
Tincturæ opii, gtt. xxiv;
" krameriæ, f℈vj;
Mucilaginis acaciæ, f℥iss;
Aquæ menthæ piperitæ, f℥iss. M.
S. A dessertspoonful every three or four hours to a child three or four years of age with fetid diarrhœa.

Diphtheria.

48.

℞. Acidi carbolici, ℈ss;
Glycerini, ℥j;
Aquæ destillatæ, f℥vj. M.
S. Use as a gargle.

49.

℞. Tincturæ ferri chloridi, f℥ss;
Quiniæ sulphatis, gr. xij;
Potassii chloratis, ℈ij;
Syrupi, f℥ss;
Glycerinæ, f℥ij. M.
S. A dessertspoonful in a wineglassful of water every three hours.

Dropsy.

50.

℞. Pilulæ hydrargyri, gr. xxx;
Digitalis foliorum, gr. v;
Scillæ pulveris, gr. xv. M.
Divid. in pilulas x.
S. One three times a day.

51.

℞. Digitalis,
Scillæ, āā gr. xxx;
Potassii nitratis, ʒj. M.
Divid. in pilulas xxx.
S. One three times daily.

Dysentery, Chronic.

52.

℞. Extracti hæmatoxyli, ʒij;
Acidi sulphurici aromatici, fʒiij;
Tincturæ opii camphoratæ, f℥iss;
Syrupi zingiberis, f℥iv. M.
S. A tablespoonful every three or four hours, in water.

Dyspepsia.

(See also Nausea and Vomiting.)

53.

℞. Bismuthi subnitratis, ʒj;
Sodii bicarbonatis,
Calumbæ radicis pulveris, āā ʒss;
Zingiberis pulveris, gr. xx. M.
Divid. in chartas xij.
S. One three times a day.

54.

℞. Calcis lactophosphatis,
Pepsinæ, āā ʒj;
Pancreatinæ, gr. xxx.
Ferri lactophosphatis, ʒj. M.
Divid. in pilulas xxx.
S. One three times a day.

55.

℞. Acidi nitromuriatici diluti, f℥ss;
Quiniæ sulphatis, gr. xxxij;
Strychniæ sulphatis, gr. ss;
Tincturæ cardamomi compositæ, f℥j;
Aquam menthæ viridis ad f℥viij. M.
S. A tablespoonful three times a day in water.

Epilepsy.

56.

℞. Sodii bromidi,
Ammonii bromidi, āā ℥ss;
Elixiris cinchonæ, f℥j;
Tincturæ belladonnæ, fʒj;
Glycerinæ, f℥j;
Aquæ, f℥j. M.
S. A teaspoonful, after meals, in water.

57.

℞. Choral, ʒij;
Ammonii bromidi, ʒiv;
Syrupi lactucarii,
" zingiberis, āā f℥iij. M.
S. A dessertspoonful three times daily.

Erysipelas.

58.

℞. Sodii sulphitis, gr. x;
Aquæ, f℥j. M.
S. Use as a wash.

Erythema.

59.

℞. Spiritûs rosmarini,
" vini rectificati, āā f℥j;
Misturæ amygdalæ amaræ, f℥vj. M.
S. Apply as a wash.

60.

℞. Hydrargyri chloridi corrosivi, gr. iss;
Glycerinæ, f℥ij
Chloroformi, ♏xx;
Aquæ rosæ, f℥vj. M.
S. Apply as a wash.

Flatulence.

61.

℞. Magnesii carbonatis, ʒij;
Spiritûs ætheris, f℥ss;
Tincturæ opii camphoratæ, fʒiij;
Aquæ menthæ viridis, q. s. ad f℥viij. M.
S. A wineglassful when needed.

(See Colic.)

62.

℞. Sodii bicarbonatis, ʒj
Spiritûs ammoniæ aromatici, fʒij;
Aquæ menthæ piperitæ, f℥iv. M.
S. A tablespoonful for an adult; one to two teaspoonfuls for a child.
(The mixture is known as Soda Mint.)

63.

℞. Olei anisi, ♏xx;
Spiritûs ætheris compositi; f℥ij. M.
S. A teaspoonful in water.

64.

℞. Sodii bicarbonatis, ʒj;
Infus. gentianæ comp., f℥iv;
Aquæ menthæ piperitæ, f℥j;
Tincturæ cardamomi compositæ, f℥ss. M.
S. A tablespoonful after meals.

Gastric Catarrh.

65.

℞. Bismuthi subnitratis, ʒj;
Potassii bromidi, ʒiss–ij;
Acidi hydrocyanici diluti, ♏xxv;
Spiritûs chloroformi, fʒj;
Mucilaginis tragacanthæ, f℥iss;
Aquæ, f℥vj. M.
S. Half a wineglassful every three or four hours (before eating).

Gonorrhœa.

66.

℞. Liquoris plumbi subacetatis, fʒj;
Zinci sulphatis, gr. vj;
Vini opii, ♏xxx;
Aquæ destillatæ, f℥vj. M.
S. Use as an injection.

67.

℞. Copaibæ,
Spiritûs ætheris nitrosi,
āā f℥ss;
Acaciæ pulveris,
Sacchari, āā ʒj;
Spiritûs lavandulæ compositi, f℥ij;
Tincturæ opii, fʒj;
Aquæ destillatæ, f℥iv. M.
S. A tablespoonful three times a day.

68.

℞. Zinci sulphatis, gr. iv;
Plumbi acetatis, gr. viij;
Tincturæ opii,
" catechu, āā ♏xv;
Aquæ destillatæ, f℥ij. M.
S. Inject thrice daily.

69.

℞. Copaibæ, f℥j;
Liquoris potassæ, fʒij;
Extracti glycyrrhizæ fluidi, f℥ss;
Spiritûs ætheris nitrosi, f℥j;
Syrupi acaciæ, f℥vj;
Olei gaultheriæ, gtt. xvj. M.
S. A tablespoonful three times a day.

70.

℞. Copaibæ,
Spiritûs ætheris nitrosi,
āā f℥ss;
Liquoris potassæ, ♏xxx;
Spiritûs lavandulæ compositi, f℥ss;
Mucilaginem acaciæ ad f℥iv. M.
S. A tablespoonful three times a day.

71.

℞. Copaibæ, f℥ss;
Tincturæ ferri chloridi,
" cantharidis, āā fʒij;
Syrupum acaciæ ad f℥iv. M.
S. A tablespoonful three times a day.

Hysteria.

72.

℞. Potassii bromidi, ʒij;
Elixiris ammonii valerianatis, f℥iij. M.
S. A dessertspoonful every three hours.

Incontinence of Urine.

73.

℞. Tincturæ ergotæ, fʒj;
" ferri chloridi,
Spiritûs chloroformi, āā ♏xxx;
Infusum quassiæ ad f℥vj. M.
S. Half a wineglassful three times a day.

Insomnia.

74.

℞. Potassii bromidi,
Chloral, āā ʒj;
Morphiæ sulphatis, gr. j;
Aquæ, f℥iij. M.
S. A tablespoonful, in water, as directed.

75.

℞. Chloral, ʒij;
Morphiæ sulphatis, gr. iss;
Syrupi aurantii, f℥j;
Aquæ, f℥ij. M.
S. A dessertspoonful at bedtime.

Menorrhagia.

76.

℞. Acidi phosphorici diluti, fʒij;
Extracti ergotæ fluidi, f℥j;
Aquæ, f℥iv. M.
S. A tablespoonful every three hours.

76.[a]

℞. Acidi gallici, gr. xxx;
Acidi sulphurici diluti, fʒj;
Tincturæ opii deodoratæ, fʒj;
Infusi rosæ compositi, f℥ iv. M.
S. A tablespoonful every four hours or oftener.

77.

℞. Tincturæ ferri chloridi,
Acidi phosphorici diluti,
Extracti ergotæ fluidi, āā fʒvj;
Aquam cinnamomi ad f℥viij. M.
S. A dessertspoonful three times a day.

Nausea, etc.

78.

℞. Tincturæ cardamomi compositæ,
Syrupi zingiberis, āā f℥ss;
Spiritûs anisi, fʒvj;
Aquæ camphoræ, f℥j;
" menthæ piperitæ, f℥v. M.
S. A tablespoonful *pro re natâ.*

79.

℞. Sodii bicarbonatis, gr. xl;
Infusi gentianæ compositi, f℥iiss;
Tincturæ cardamomi compositæ, f℥ss;
Aquæ menthæ piperitæ, f℥iij. M.
S. A tablespoonful three times a day.

80.

℞. Opii pulveris, gr. vj;
Ætheris, gtt. xij;
Syrupi, f℥j;
Aquæ menthæ piperitæ, f℥v. M.
S. A tablespoonful every hour. (Shake before using.)

81.

℞. Acidi sulphurici aromatici, fʒiij;
Tincturæ cardamomi compositæ;
Syrupi aurantii corticis, āā fʒj;
Aquæ camphoræ, f℥iiss. M.
S. A tablespoonful *pro re natâ.*

(See Vomiting.)

Neuralgia.

82.

℞. Iodoformi, gr. xxx;
Aquæ ammoniæ,
Chloroformi, āā f℥ss;
Linimenti saponis camphorati, f℥iij. M.
S. Rub over the seat of pain twice daily.

83.

℞. Quiniæ sulphatis, ʒj
Morphiæ sulphatis, gr. iss.
Strychniæ sulphatis, gr. ij;
Acidi arseniosi, gr. ij;
Extracti aconiti, gr. xv. M.
Divid. in pilulas xxx.
S. One pill three or four times daily.

84.

℞. Zinci phosphidi, gr. v;
Ergotinæ, gr. iiss. M.
Divid. in pilulas xxx.
S. One after each meal.

Phthisis, etc.

85.

℞. Olei morrhuæ,
Syrupi calcis lactophosphatis, āā f℥iv;
Acaciæ pulveris, ℥j;
Acidi phosphorici diluti, ʒij;
Olei amygdalæ amaræ, gtt. vj;
Aquæ, f℥j. M.
S. A tablespoonful three times a day.

86.

℞. Ovorum vitelli, iij;
Olei morrhuæ, f℥viij;
Vini Xerici, f℥iv;
Alcoholis, fʒj;
Acidi phosphorici diluti,
Syrupi, āā f℥j;
Aquæ amygdalæ amaræ, f℥viij. M.
S. A tablespoonful three times a day.

Pleuritic Effusions.

87.

℞. Olei tiglii, fʒj;
Ætheris fortioris, fʒij;
Tincturæ iodinii, fʒv. M.
S. Apply two or three coats at a time with a camel's hair brush, over a small surface, once a week.

If a stronger paint be indicated, the following may be employed:—

88.

℞. Olei tiglii, fʒij;
Ætheris fortioris, fʒiv;
Tincturæ iodinii, fʒij;
Potassii iodidi, ʒj;
Iodinii, gr. x. M.
S. Apply as directed in previous formula.

Pruritus.

89.

℞. Camphoræ pulveris,
Chloral, āā ʒj;
Unguenti aquæ rosæ, ℥j. M.
S. Apply locally (only where the skin is unbroken).

(See Pruritus Vulvæ.)

Pruritus Vulvæ.

90.

℞. Zinci sulphocarbolatis, ʒj;
Aquæ destillatæ, f℥ij. M.
S. Apply twice a day.

91.

℞. Sodii boratis, ʒij;
Morphiæ muriatis, gr. xx;
Acidi hydrocyanici diluti, fʒj;
Glycerinæ, f℥j;
Aquæ rosæ, f℥viij. M.
S. Apply with a soft sponge.

92.

℞. Zinci oxidi, ʒj;
Sodii boratis, ʒij;
Cerati, ʒiv;
Olei amygdalæ dulcis, q. s.
Morphiæ muriatis, gr. j. M.
S. Apply locally.

93.

℞. Morphiæ acetatis, gr. j;
Liquoris potassii arsenitis, fʒij;
Aquam ad f℥iij. M.
S. A teaspoonful three times a day.

94.

℞. Acidi carbolici, gr. x;
Morphiæ acetatis, gr. viij;
Acidi hydrocyanici diluti, fʒij;
Glycerinæ, fʒiv;
Aquam ad f℥iv. M.
S. Apply locally.

95.

℞. Potassii cyanidi, gr. j–iss;
Adipis, ʒiv:
Liquoris calcis, fʒiv. M.
S. Apply locally.

96.

℞. Infusi hamamelis, (℥ ij to Oj) Oj;
Zinci sulphatis, ʒss;
Morphiæ sulphatis, gr. xx. M.
S. Apply on lint.

97.

℞. Acidi boracici (pulv. subtiliss.), ʒiv;
Unguenti, ℥j. M.
S. Apply locally.

98.

℞. Sodii bisulphitis, ʒiv;
Aquæ, f℥iv. M.
S. Apply locally.

99.

℞. Hydrargyri chloridi corrosivi, gr. j;
Aluminis, gr. xx;
Amyli, ʒiss;
Aquæ, f℥vj. M.
S. Apply locally.

100.

℞. Aluminii nitratis, gr. vj;
Aquæ destillatæ, f℥j. M.
S. Apply locally.

Rheumatism.

101.

℞. Acidi salicylici, gr. xv;
Ammonii citratis, gr. xxx;
Syrupi, f℥j;
Aquam destillatam ad f℥iv. M.
S. A single dose.

102.

℞. Tincturæ arnicæ, f℥j;
" camphoræ,
" opii,
Spiritûs ammoniæ, āā f℥ss;
Olei olivæ, f℥j. M.
S. Liniment.

103.

℞. Potassii iodidi, ʒj;
Tincturæ digitalis, fʒij;
Vini colchici radicis, fʒij;
Syrupi, f℥j;
Aquæ, f℥v. M.
S. A tablespoonful every three hours.

104.

℞. Acidi salicylici, ℥ss;
Tincturæ opii deodoratæ, fʒij;
Syrupi, f℥j;
Mucilaginis acaciæ, f℥ij. M.
S. A teaspoonful three times a day.

Salivation.

105.

℞. Acidi tannici, gr. xxx–ʒj;
Mellis, f℥ij;
Aquæ, f℥vj. M.
S. Mouth wash.

106.

℞. Zinci sulphatis, gr. xxx;
Tincturæ ciuchonæ compositæ, f℥j;
Aquæ, f℥iij. M.
S. Gargle.

107.

℞. Potassii chloratis, ʒiss;
Glycerini, f℥ss;
Aquæ, f℥iv. M.
S. Gargle.

Sick Headache.

108.

℞. Potassii bromidi, ʒij;
Extracti belladonnæ fluidi, ♏xxx;
Aquæ destillatæ, f℥ij. M.
S. Half a teaspoonful to a teaspoonful every three or four hours.

Sore Nipples.

109.

℞. Acidi salicylici, ℥j;
Sodii boratis, ʒiv;
Glycerinæ, f℥iv. M.
S. Apply to the breast.

110.

℞. Plumbi nitratis, gr. xx-xxx;
Glycerinæ, f℥j. M.
S. Apply to the breast.

111.

℞. Acidi tannici, ʒj;
Collodii, f℥j. M.
S. Apply to the breast.

112.

℞. Iodoformi, ʒj;
Glycerinæ, f℥ss–j. M.
S. Apply to the breast.

Sore Throat.

113.

℞. Acidi carbolici, ♏ xx ;
" acetici, ʒss ;
Mellis, fʒij ;
Tincturæ capsici, fʒj ;
Aquam ad f℥vj. M.
S. Gargle.

Spinal Irritation.

114.

℞. Potassii bromidi, ℥ss ;
Extracti valerianæ fluidi, f℥ij ;
Spiritûs ammoniæ aromatici, f℥j ;
Syrupi, f℥j. M.
S. A teaspoonful three or four times daily.

Toothache.

115.

℞. Creasoti,
Aquæ ammoniæ fortioris,
Tincturæ myrrhæ, āā fʒj. M.
S. Apply on very small piece of cotton-wool soaked into the cavity.

116.

℞. Acidi carbolici (sol. sat.),
Tincturæ opii,
Extracti aconiti fluidi, āā fʒj ;
Olei menthæ piperitæ, ♏ xxx. M.
S. Apply on cotton to the cavity.

117.

℞. Creasoti,
Chloroformi, āā fʒj ;
Vini opii, fʒij ;
Tincturæ benzoini, ♏ xxx. M.
S. Apply on cotton to the cavity.

Ulcers.

118.

℞. Collodii, f℥j ;
Olei ricini,
Acidi carbolici, āā fʒss. M.
S. Apply locally.
The name *carbolic collodion* has been given to this mixture.

119.

℞. Acidi carbolici, ℥ss ;
Camphoræ pulveris, ʒss ;
Cerati, ℥vij. M.
S. Apply locally.

Vomiting.

120.

℞. Acidi hydrocyanici diluti, gtt. xx ;
Bismuthi subnitratis, ʒj ;
Tincturæ gentianæ compositæ, fʒiij ;
Syrupi zingiberis, f℥j ;
Spiritûs ammoniæ aromatici, fʒj ;
Aquæ, f℥ij. M.
S. A tablespoonful three times daily.

121.

℞. Chloroformi, f℥ij;
Tincturæ aconiti, f℥iss;
" opii camphoratæ, f℥ss;
Aquæ puræ, f℥iij. M.
S. A teaspoonful every hour.

122.

℞. Bismuthi subnitratis, ℥j;
Potassii bromidi, ℥iss;
Acidi hydrocyanici diluti, ♏xxx;
Spiritûs chloroformi, f℥j;
Mucilaginis tragacanthæ, f℥iss;
Aquam ad f℥vj. M.
S. Two tablespoonfuls every three or four hours.

(See Nausea.)

Vomiting of Pregnancy.

123.

℞. Spiritûs pyroxylici rectificati, f℥ij;
Tincturæ cardamomi compositæ, f℥viij. M.
S. A teaspoonful every four hours.

124.

℞. Acidi sulphurici diluti, f℥ij;
Syrupi aurantii corticis, f℥iss;
Aquæ, f℥iiss. M.
S. A tablespoonful every three or four hours.

125.

℞. Acidi nitrici diluti,
" muriatici diluti, āā f℥ij;
Tincturæ gentianæ compositæ, f℥ss;
Aquam ad f℥viij. M.
S. Two tablespoonfuls three times a day.

(See Vomiting.)

Whooping-cough.

126.

℞. Chloral, gr. xij;
Vini ipecacuanhæ, f℥j;
Syrupi aurantii corticis, f℥ij;
Aquæ menthæ piperitæ, f℥ss. M.
S. A teaspoonful every fifteen or twenty minutes.

127.

℞. Potassii bromidi, gr. xxx;
Tincturæ conii, f℥j;
Syrupi scillæ, f℥iij;
Aquæ, f℥vj. M.
S. A tablespoonful every two hours.

128.

℞. Potassii bicarbonatis, ℥ij;
" bromidi, ℥ss;
Syrupi ipecacuanhæ,
" tolutani, āā f℥j;
Aquæ, f℥j. M.
S. A teaspoonful every four or five hours.

129.

℞. Extracti trifolii pratensis fluidi,
——æsculi hippocastani fluidi, āā f℥ss;
Syrupi, q. s. ad f℥iv. M.
S. A tablespoonful every three hours.

HINTS IN REGARD TO THE HYGIENIC AND THERAPEUTIC TREATMENT OF YOUNG CHILDREN.

Rules for Management of Infants during the Hot Season.

The following special rules for the care of young children during the summer season are those recommended by the Obstetrical Society of Philadelphia to the thoughtful attention of mothers.[1] As they are of universal applicability in every portion of this country, and embrace in their recommendations so many points on which the practitioner is frequently consulted by parents in connection with the hygiene and general management of infants, it is hoped that their reproduction here will be the means of giving them a still more widespread dissemination:—

RULE 1.—Bathe the child once a day in tepid water. If it is feeble, sponge it all over twice a day with tepid water, or with tepid water and vinegar. The health of a child depends much upon its cleanliness.

RULE 2.—Avoid all tight bandaging. Make the clothing light and cool, and so loose that the child may have free play for its limbs. At night undress it, sponge it, and put on a slip. In the morning remove the slip, bathe the child, and dress it in clean clothes. If this cannot be afforded, thoroughly air the day-clothing by hanging it up during the night. Use clean diapers, and change them often. Never dry a soiled one in the nursery or in the sitting-room, and never use one for a second time without first washing it.

[1] A committee of this Society, appointed "to consider the Causes and the Prevention of Infant Mortality during the Summer Months," reported these rules March 5, 1874. The committee consisted of Drs. William Goodell (Chairman), J. Forsyth Meigs, John L. Ludlow, Albert H. Smith, John S. Parry, and William F. Jenks.

RULE 3.—The child should sleep by itself in a cot or a cradle. It should be put to bed at regular hours, and be early taught to go to sleep without being nursed in the arms. Without the advice of a physician, never give it any *Spirits*, *Cordials*, *Carminatives*, *Soothing Syrups*, *or Sleeping Drops. Thousands of children die every year from the use of these poisons.* If the child frets and does not sleep, it is either hungry or else ill. If ill, it needs a physician. Never quiet it by candy or by cake; they are the common causes of diarrhœa and of other troubles.

RULE 4.—Give the child plenty of fresh air. In the cool of the morning and evening, send it out to the shady sides of broad streets, to the public squares, or to the Park. Make frequent excursions on the rivers. Whenever it seems to suffer from the heat, let it drink freely of ice-water. Keep it out of the room in which washing or cooking is going on. It is excessive heat that destroys the lives of young infants.

RULE 5.—Keep your house sweet and clean, cool and well aired. In very hot weather let the windows be open day and night. Do your cooking in the yard, in a shed, in the garret, or in an upper room. Whitewash the walls every spring, and see that the cellar is clear of all rubbish. Let no slops collect to poison the air. Correct all foul smells by pouring into the sinks and privies Carbolic Acid or Quicklime, or the Chloride of Lime, or a strong solution of Copperas. These articles can be got from the nearest druggist, who will give the needful directions for their use. Make every effort yourself, and urge your neighbors to keep clean the gutters of your street or of your court.

RULE 6.—*Breast-milk is the only proper food for infants.* If the supply is ample and the child thrives on it, no other

kind of food should be given—while the hot weather lasts. If the mother has not enough, she must not wean the child, but give it, besides the breast, goat's or cow's milk, as prepared under Rule 8. Nurse the child once in two or three hours during the day, and as seldom as possible during the night. Always remove the child from the breast as soon as it has fallen asleep. Avoid giving the breast when you are over-fatigued or over-heated.

Rule 7.—If, unfortunately, the child must be brought up by hand, it should be fed on a milk-diet alone—that is, warm milk out of a nursing bottle, as directed under Rule 8. Goat's milk is the best, and, next to it, cow's milk. If the child thrives on this diet, *no other kind of food whatever should be given while the hot weather lasts.* At all seasons of the year, but especially in summer, there is no safe substitute for milk if the infant has not cut its front teeth.[1] *Sago*, *arrow-root*, *potatoes*, *corn-flour*,

[1] The practitioner is reminded that the *periods of eruption of the teeth* are the following:—

First Dentition.

As a rule, the teeth of the lower jaw precede those of the upper, except in the case of the lateral incisors.

Central incisors	5th to 8th month.
Lateral incisors	7th to 9th "
First molars	12th to 16th "
Canines	16th to 20th "
Second molars	20th to 36th "

Second Dentition.

First molars	5th to 7th year.
Central incisors	7th to 8th "
Lateral incisors	8th to 9th "
First bicuspids	9th to 10th "
Second bicuspids	10th to 1'th "
Canines	11th to 12th "
Second molars	12th to 13th "
Third molars	17th to 21st "

crackers, bread, every patented food, and every article of diet containing starch, cannot and must not be depended on as food for very young infants. Creeping or walking children must not be allowed to pick up unwholesome food.

Rule 8.—If the milk is known to be pure, it should have one-third part of hot water added to it, until the child is three months old; after this age the proportion of water should be gradually lessened. Each half pint of this food should be sweetened, either with a heaping dessertspoonful of sugar of milk, or with a teaspoonful of crushed sugar. When the heat of the weather is great, the milk may be given quite cold. Be sure that the milk is unskimmed; have it as fresh as possible, and brought very early in the morning. Before using the pans into which it is to be poured, always scald them with boiling suds. In very hot weather, boil the milk as soon as it comes, and at once put away the vessels holding it in the coolest place in the house—upon ice if it can be afforded, or down a well. Milk, carelessly allowed to stand in a warm room, soon spoils and becomes unfit for food.

Rule 9.—If the milk should disagree, a tablespoonful of lime-water[1] may be added to each bottleful. Whenever pure milk cannot be got, try the Condensed Milk, which often answers admirably. It is sold by all the leading druggists and grocers, and may be prepared by adding to ten tablespoonfuls of boiling water without sugar, one tablespoonful or more of the milk, according to the age of the child. Should this disagree, a teaspoon-

[1] *To make lime-water*, take a handful of quicklime, slake it and put it into a quart bottle full of soft water. Shake the bottle well, and then allow the undissolved portion of the lime to settle. Pour off the clear liquid when needed, replacing it with more water, and afterwards shaking the bottle briskly.

ful of arrow-root, of sago, or of corn-starch may be cautiously added to a pint of the milk, as prepared under Rule 8. If milk in any shape cannot be digested, try, for a few days, pure cream diluted with three-fourths or four-fifths of water—returning to the milk as soon as possible.

Rule 10.—The nursing-bottle must be kept perfectly clean; otherwise the milk will turn sour, and the child will be made ill. After each meal, it should be emptied, rinsed out, taken apart, and the nipple and bottle placed in clean water, or in water to which a little soda has been added. It is a good plan to have two nursing-bottles, and to use them by turns. The best kind is the plain bottle with a rubber nipple and no tube.

Rule 11.—Do not wean the child just before or during the hot weather; nor, as a rule, until after its second summer. If suckling disagrees with the mother, she must not wean the child, but feed it in part, out of a nursing-bottle, on such food as has been directed. However small the supply of breast-milk, provided that it agrees with the child, the mother should carefully keep it up against sickness; it alone will often save the life of a child when everything else fails. When the child is over six months old, the mother may save her strength by giving it one or two meals a day of stale bread and milk, which should be pressed through a sieve and put into a nursing-bottle. When from eight months to a year old, it may have also one meal a day of the yolk of a fresh and rare-boiled egg, or one of beef or mutton-broth into which stale bread has been crumbed. When older than this, it can have a little meat finely minced; but even then milk should be its principal food, and not such food as grown-up people eat.

To these recommendations may be added the following suggestions for the dietetic treatment of weakly and emaciated infants two or three months old, brought up by hand, in whom milk with lime-water excites griping and flatulence, with occasional attacks of vomiting and purging.[1] In these cases we can often succeed in rendering the milk and lime-water digestible by adding an aromatic. Thus, to half a pint of cold milk add a teaspoonful of caraway seeds or chopped cinnamon, inclosed in a small muslin bag, and boil for five minutes. The bag is then withdrawn, and the lime-water, and milk-sugar, are afterwards added as usual.

If this do not succeed, one of the diets given below can be tried.

The child is to be fed every three hours from a feeding bottle with the following in alternate meals:—

1. One teaspoonful of Liebig's food for infants[2] dissolved in a teacupful of new milk and water (equal parts), with the addition of one tablespoonful of cinnamon-water.

2. A teacupful of fresh whey containing a teaspoonful of cream.

If the amount of milk given above cannot be digested, as often happens, the proportion of water used to dilute

[1] Eustace Smith, Wasting Diseases of Infants and Children; London, 1870, p. 281.

[2] *Liebig's Food for Infants* consists of half an ounce (rather more than a heaped-up tablespoonful) of wheaten-flour, an equal quantity (rather more than a heaped-up dessertspoonful) of malt flour, 7½ grains of bicarbonate of potassium, and an ounce of water well mixed; to which is added five ounces of fresh milk. The whole is put on a gentle fire, until it begins to thicken, when it must be removed, stirred for several minutes, again heated and stirred till fluid, and then boiled, and passed through a sieve. It is slightly aperient, and, in cases of diarrhœa, prepared chalk, gr. xx., may be substituted for the bicarbonate of potassium.

the milk may be increased to two thirds; or in some of the meals the milk may be altogether omitted, using instead barley-water, or equal parts of barley-water and weak chicken-broth, in which the Liebig's food can be dissolved.

In the above cases Prof. Charles D. Meigs[1] recommends the following: A scruple of gelatin (*i. e.*, a square inch of the gelatin cake) is soaked in cold water, and is then boiled for ten or fifteen minutes in half a pint of water until it dissolves. To this, at the termination of the boiling, are added, while stirring, three ounces of milk, and a teaspoonful of arrow-root, the latter having been previously mixed into a paste with a little cold water. Lastly, just before removal from the fire, half an ounce of cream is stirred up with the rest, and the whole is sweetened with loaf sugar. Of this food three or four ounces or more can be given every two or three hours from a feeding-bottle.

These diets are suitable to all infants suffering from simple atrophy due to improper feeding. It will, however, be necessary to vary the quantities somewhat according to age. Thus, a child of six months old will usually be able to take a teaspoonful of Liebig's food for infants, dissolved in milk more or less diluted, for each meal.

For a child of the same age, Prof. Meigs's food may be strengthened by increasing the quantity of milk to six or ten ounces, and of cream to one or two ounces.

In all these cases of simple atrophy just mentioned, a wet nurse should be provided if possible.

[1] J. F. Meigs and W. Pepper on Diseases of Children; Philada., 1877.

Brief Rules for Cases of Emergency in Children.[1]

1. If the child is suddenly attacked with vomiting, purging, and prostration, send for a doctor at once. In the mean time, put the child for a few minutes in a hot bath, then carefully wipe it dry with a warm towel, and wrap it in warm blankets. If its hands and feet are cold, bottles filled with hot water and wrapped in flannel should be laid against them.

2. A mush-poultice, or one made of flaxseed meal, to which one-quarter part of mustard flour has been added, or flannels wrung out of hot vinegar and water, should be placed over the belly.

3. Five drops of brandy in a teaspoonful of water may be given every ten or fifteen minutes; but if the vomiting persist, give this brandy in the same quantity of milk and lime-water.

4. If the diarrhœa has just begun, or if it is caused by improper food, a teaspoonful of castor oil, or of the spiced syrup of rhubarb, should be given.

5. If the child has been fed partly on the breast and partly on other food, the mother's milk alone must now be used. If the child has been weaned, it should have its milk-food diluted with lime-water, or should have weak beef-tea, or chicken-water.

6. The child should be allowed to drink cold water freely.

7. The soiled diapers or the discharges should be at once removed from the room, but saved for the physician to examine at his visit.

[1] These rules were also suggested by the Committee of the Obstetrical Society of Philadelphia, previously alluded to (p. 231).

Several dietetic articles especially adapted for young children are described under the head of "Dietetic Preparations for the Sick." It is not considered expedient or desirable to isolate them from such a general list, as they are appropriate, in some instances, as auxiliary to the treatment of the adult sick; and the proportions of the ingredients employed may be varied, according to the necessities of the case, the age of the child, its personal predilections, etc.

Therapeutics of the Bowel Affections of Children.[1]

ALL children when suffering from diarrhœa should be kept quiet in a partially darkened room; and young infants should not be jolted, as is the habit of mothers and nurses, under the idea of amusing them. Young infants, when the diarrhœa is severe, can be kept more easily quiet when laid on a pillow instead of the lap, and should be moved as little as possible even while changing the napkin. The room should be well ventilated—mothers usually keeping it too close, under the fear of taking cold; and in the daytime the infant when awake should be carefully carried into the shade in the open air. In severe diarrhœa of young infants also warm applications should be applied to the abdomen. A spice-bag should be made by inclosing between two layers of coarse flannel about six inches square, and quilting, cloves, allspice, cinnamon, and aniseed, of each half an ounce, bruised in a mortar. This is to be soaked for a few minutes in equal parts of hot brandy (or other spirits) and water, applied

[1] Condensed from an excellent paper by Dr. A. A. Smith, of Bellevue Hospital Medical College, in the *N. Y. Medical Record* for 1879.

to the abdomen, and renewed when it gets cool. In this way we get the effects of a poultice, and the sedative and antiseptic effects of the spices.

Reduction of Temperature.—Great importance is attached to this as an adjuvant. When the rise of temperature is slight, say 102° Fahr. or less, sponging the body with water at about 80° will, if repeated often enough, reduce it to about its normal condition; but in all cases when the rise is above 102° a form of the wet pack should be resorted to. For this, having placed the child on a bed, cover it from the axillæ to the ankles (leaving the arms and feet uncovered) by means of a small folded sheet, on which water of the desired temperature is poured by means of a pitcher. The first application should be made by the practitioner himself, in order to allay the fears of the friends excited by the cries of the child, and to exhibit to them the wonderful power this means possesses of reducing temperature, calming the restlessness and irritability of the child, and inducing sleep. The temperature of the water may at first be 90°, and gradually reduced until it is brought down to 80° in a few minutes; or even lower when the temperature of the body is very high or rapidly rises again after reduction. It should be reduced to 99°, and usually sinks lower still when the child is taken out of the pack. According to whether this reduction to 99° is obtained, the child may be left in the pack twenty or thirty minutes, longer or shorter; and when removed should be put into a thin blanket and covered up, and allowed to sleep. In very severe cases, when the temperature rises to 105°, or higher, the cold may have to be applied every hour or two, and then the child need not be removed, even for days, from a bed conveniently adapted for this procedure, termed a "Kibbe's cot."

Too Frequent Nursing as a Cause of Diarrhœa.—Irregular and too frequent nursing are a frequent cause of diarrhœa, and by attention to this point it may be often cured. A child under four months will, as a rule, have two and sometimes three, evacuations daily, and this is within the range of health. Many cases of diarrhœa are met with in which there is but little constitutional disturbance. There is frequency of stools, but the appearance of these is not unhealthy. Bismuth, three grains every two or three hours, will cure such cases.

Preternatural Acidity in the digestive organs produces diarrhœa, which is accompanied by considerable pain, the passage of small cheesy-looking masses into the stools, the odor of which is acid, and sometimes offensive, and the reaction decidedly acid. A teaspoonful of lime-water in two of milk three times a day, or chalk, may be given with good effect; and an occasional laxative is indicated for the removal of any of the cheesy masses that may be acting as irritants, or the laxative may be given at the commencement when the existence of any irritant is suspected. A good formula is pulv. rhei gr. xv, sod. bicarb. gr. xxv, aq. m. pip. f℥ij. A drachm is a dose for an infant between one and four months of age.

Dentition as a Cause of Diarrhœa.—Lancing the gums is here especially indicated, and it is far better to err in lancing them too soon than to fail to do so when necessary. A child having from ten to twelve stools a day has often been relieved by lancing the gums, without any other treatment. It is in these cases that the bromides prove so effectual. Of a mixture consisting of sod. brom. ʒss, mucil. acaciæ, aquæ, āā ad f℥ij, a drachm may be given every three hours to a child between six months and a year. The bromide diminishes the reflex disturbance caused by the dentition, and the mucilage is soothing to the irritated intestinal membrane.

Errors in Diet as a Cause of Diarrhœa.—Another cause of diarrhœal troubles is the giving of all sorts of diet too early. There is a desire to make the child strong and grow more rapidly. Meat, vegetables, and farinaceous articles in abundance are given to children even eight or ten months old. A child under eight months ought to have no other diet than milk, and even up to two years milk should be its main diet. Human milk is the best during the first year, or until weaning; but often from necessity the child is brought up on the bottle. During the first eight months cow's milk diluted one-fourth with barley-water, makes the best diet. The ground or crushed barley should be boiled with water of sufficient quantity, so that when cold it is about as thick as thin cream. The milk should be given about blood-warm and a little sweetened. What place should condensed milk be given in the feeding of children? I should give it a place on the shelf at the grocer's. I have tried the condensed milk with children thoroughly, and have seen it tried in the practice of others, and must protest against its use. Children fed on condensed milk, although they may thrive well apparently, yet when they fall ill show very little resisting power, and, particularly when they fall ill of diarrhœa, they weaken very rapidly and the diarrhœa is apt to be obstinate. There are exceptional cases in which it may be used, and some cases in which it is desirable to use it for a short time. When bottle-fed children suffer from diarrhœa it is well to boil the milk and make the barley-water thinner and give more of it, say one-third barley-water to two-thirds boiled milk. I have found thoroughly cooked wheat flour an admirable food for children with diarrhœa. Have it prepared in this way: Put about two pounds of flour in a muslin bag, tie a string around the top of it, and suspend it in a kettle of water

and boil it for five hours; then let it get cold. Take off the bag, cut off the outside dough and grate it. Thicken boiled milk with this to about the consistency of a thin gruel, or about thick enough for it to pass through the rubber nipple of a nursing-bottle. All food for children should be thoroughly cooked. Still more is this to be observed when they are ill of diarrhœa. As a rule, feed children suffering with acute diarrhœa just as little food as will satisfy their hunger, and often a little cold water will relieve their thirst and lessen the desire for food. Avoid alcoholic stimulants unless there is exhaustion. Champagne iced may be given in small quantities, if there is obstinate vomiting.

Flatulent Diarrhœa.—There is a flatulent diarrhœa which occurs in young children and gives much trouble. The movements are frequent but very small, and the flatulence is sufficient to keep the child awake at nights.

I have found the following prescription an excellent one in such cases:—

℞.	Magnes. calcin.	ʒj.
	Spts. amm. aromat.	♏xl.
	Tinct. asafœt.	ʒj.
	Anisette	fʒvj.
	Aq. cinnamomi, q. s., ad	f℥iv.

M. Sig. fʒj every half hour until relieved, to a child from three weeks to four months old. Two or three doses will usually relieve.

Diarrhœa Dependent on Non-digestion of Sugar.—There is a diarrhœa which occurs in the summer, characterized by frequency of discharges; the movements are green, accompanied with pain, and in many cases the stomach is so irritable that vomiting is a troublesome symptom. Probably the diarrhœa is due to non-digestion of sugar. In connection with such cases I would like to call your attention to kumyss or fermented milk. In this preparation the milk has already taken the first step in digestion.

There is or ought to be no sugar in it; the casein is in a fixed condition, and consequently cannot undergo the changes of coagulation and putrefaction, and there is a small quantity of alcohol, but it is in such a combination that it is easily assimilated. The kumyss is charged with carbonic acid gas, but children do not take it readily with the gas in. It may be gotten rid of by taking the kumyss out of the bottle and pouring it from one pitcher to another a few times. A small quantity may be kept out for immediate use, and the remainder put back into the bottle, the bottle corked and put into a cool place. Sometimes children who are unable to retain anything else, can take a teaspoonful of kumyss at a time and digest it, and frequently without any medicinal treatment will recover under its use. Twelve hours is as long as it can be kept safely, after once uncorking it. The child need take no other food while it is taking the kumyss. It is itself food and drink. It is sour, and mothers are tempted to sweeten it to make it palatable. Of course it should never be sweetened, and should never be given within two hours after any other form of milk, and should be given cold. After the first repugnance to it children take it quite readily; even children as young as six or eight months can be made to like it by taking advantage of their thirst and giving it at first in small quantities. Kumyss may be used in many forms of diarrhœa because of its easy digestion.

Dysenteric Diarrhœa.—There is another form of diarrhœa quite common in summer, characterized by what are known as dysenteric discharges—that is, quite frequent evacuations and straining, as in dysentery, and the evacuations are about the consistence of pudding, or thin jelly, and are usually of a pinkish color. This pinkish color is due to the admixture of blood and mucus with

the substance that passes the bowels. I have found small doses of castor oil and opium, given in mucilage, an excellent combination in such cases, as in the following prescription :—

℞.	Ol. ricini	ℨj.
	Sacch. lactis	ℨss.
	Tinct. opii camph.	♏xxxij to fℨiss.
	Mucilag. acaciæ,	
	Aquæ puræ, āā q. s. ad	f℥j.
M.	Sig. fℨj every 2 or 3 hours.	

Give the paregoric according to the age of the child. For a child under a year, four to eight drops. For child of one to two years, ten drops. Don't forget the general suggestions in regard to diet in all cases of diarrhœa. It is well sometimes in these cases to give starch-water enemata. If the enemata are given, the paregoric may be left out of the castor oil mixture, and laudanum may be put in the enema. One or two drops of laudanum with one to three tablespoonfuls of starch-water may be given, according to the age of the child. The starch-water should be made about as thick as thin cream, and given tepid. It may be repeated every three to six hours, according to the severity of the attack.

Inflammatory Disorders.—There is a large class of summer diarrhœas included under the term of inflammatory disorders. They are accompanied with great pain; frequency of movements; there may or may not be a small quantity of blood passed with the movements, more or less increase of temperature, with disturbance of the nervous system, and there may or may not be gastric irritability. The indications are to reduce the temperature, manage the diet according to the directions I have given you, surround the child by the best possible hygiene, put the warm applications over the abdomen, and give internally a combination of opium and camphor.

Tully's powder, which consists of morphine, camphor, and prepared chalk, makes a good combination. The dose for an adult is the same as Dover's powder. Ten grains contain one-sixth of a grain of morphine and a little over three grains of camphor. A child three to six months old may be given an eighth of a grain every two to six hours, according to the severity of the attack and the control the powder has over it. A child six to eighteen months may be given one sixth to one-fourth of a grain in the same way. After the acute symptoms have been controlled there remains in many cases a tendency to looseness of the bowels, with very little constitutional disturbance. Stop the Tully's and give the following:—

℞.	Ac. sulph. dil.	♏xxiv.
	Salicin.	gr. xxiv.
	Glycerinæ	f℥iij.
M.	Sig. fℨj t. d.	

Do not give it within a half-hour of the taking of milk. The sulphuric acid has a tonic and astringent effect, and the salicin, besides its tonic effect, acts also as an antifermentative.

Cholera Infantum.—And now, as to the treatment of a disorder of children, which is the dread of all physicians, especially young ones, and justly so, for it is a formidable disease. I look upon cholera infantum as a disorder of the nervous system, and the disturbances of the alimentary canal as only the local manifestations of a constitutional disorder. It occurs from great heat, but it has always seemed to me that in addition to great heat there was some other element. I have noticed that cases are much more frequent when, besides great heat, there were certain atmospheric influences which depress the nervous system greatly. "Dog days," as they are called, are very fruitful in the production of cholera infantum. Among

the poor, great heat, poorly ventilated rooms, poor hygiene in all its forms and with all its attendants, improper food, particularly bottle food, favor the development of the disease. I recognize two varieties of cholera infantum, and divide them, according to their manifestations, into congestive and exhaustive. In the congestive form there is redness of the surface of the body, especially about the face and head; redness of the conjunctiva, great elevation of temperature, the pulse rapid and full, the nervous symptoms marked, twitching of the muscles, and frequently convulsions; the vomiting and purging violent, the matters vomited and passed being very thin and of enormous quantity. All of these symptoms come on very rapidly, differing in this respect from other forms of diarrhœa. The two special indications are to reduce the temperature and control the nervous manifestations. Apply cold according to the directions I have given you. Give hypodermic injections of quinine and morphine. Give to a child of six months one grain of quinine and about $\frac{1}{200}$ of a grain of morphine every four or six hours, according to the indication. For each additional six months of age an additional half grain of quinine and an additional $\frac{1}{200}$ of a grain of morphine. To simplify the matter I will give the prescriptions of the solutions of quinine and morphine:—

℞.	Morph. sulph.	gr. ss.
	Aquæ destillat.	f℥j.

M. Sig. ♏v by hypodermic injection for a child six months old.

℞.	Quiniæ sulph.	ʒj.
	Ac. sulph. dil.	q. s.
	Acid. carbol. cryst.	gr. v.
	Aquæ destillat.	f℥j.

M. Sig. ♏viij by hypodermic injection for a child six months old.

Usually the stomach is so irritable that medicines and food are both vomited. After the temperature is reduced and the nervous system is rested, small quantities of food

can be given. Small pieces of ice may be given to allay thirst.

In the other variety, the exhaustive form of the disease, there is paleness of the surface of the body; little or no elevation of temperature; indeed, the temperature in some cases is below normal; the pulse is rapid and feeble; the nervous symptoms, although present, are not as marked as in the other variety. The vomiting and purging are violent, the child sometimes getting rid of more fluid in a few hours than it has taken in days. The emaciation is very rapid and great. The indications for treatment are to check this enormous loss of fluid and sustain the patient. Our main reliance must be on opium and alkalies and stimulants, with the general directions I have given you in the beginning of the lecture. Opium in small doses, in addition to the other effects claimed for it, is a cardiac stimulant, thus meeting one of the chief indications in this disease. A combination of tinctura opii camphorata and mistura cretæ may be prescribed with advantage in such cases.

Sometimes nothing is retained by the stomach. In such cases, it is necessary for us to give the opium hypodermically. Give the $\frac{1}{200}$ grain morphine as directed in the other variety of the disease, but do not give the quinine.

Alcoholic stimulants should be given. Brandy is the best. Give five drops of brandy in a teaspoonful of water, every hour, to a child of six months, if there is great exhaustion. This quantity may be increased or diminished according to the indications. In some cases of cholera infantum a child becomes suddenly much more exhausted, pulse becomes more rapid, extremities are cold, perspiration comes out freely, and the child seems to be going into collapse. An enema of hot water will sometimes revive such a child wonderfully. Let a good

quantity of hot water be used, say half a pint, and hold a towel to the anus afterward, in order to have the water retained as long as possible. Along with this give internally spirits of camphor, from six to ten drops. It may be put in with the brandy, and the two given together for a few hours. In any case of diarrhœa, where these symptoms of great exhaustion occur with the coldness of the extremities, the hot water enemata may be given.

Beef-Tea.—The very common habit of giving beef-tea in the diarrhœa of children, prompts me to say a word in regard to its use. Of course, it is given with a view to sustain the strength of the child, but I have found that almost invariably it acts as an irritant and aggravates the disease. Sometimes it seems to pass the bowels in the same form in which it was taken. In any case of acute diarrhœa I would advise you not to give beef-tea.

Opium.—I believe that opium is given too indiscriminately in the diarrhœas of children. It has its uses, and is an orthodox remedy in such disorders, but it is given very frequently when other remedies would do quite as well and much better, and would produce none of the ill effects of opium.

Good nursing; removal of causes; keeping the patient quiet; regulation of the diet: improving the hygiene; reducing the temperature; removing the causes of disturbance of the nervous system, will, in the great majority of the cases of diarrhœa in children, do away with the necessity for medicines.

Medication for young children, so far as concerns the therapeutic application of remedies in doses appropriate to the age of the child and other governing circumstances, has been fully discussed in an earlier chapter of this book (page 94), under the head of "Doses for Children." A tabular classification of "Doses for Young Children," as compared with

the adult, may be found on page 98. Mention is made, under these subjects, of the tolerance of children for certain remedies, and their intolerance of others. Much might be added in regard to the hygiene of infants—their clothing, baths, hours of rest, exposure to atmospheric changes, etc. Some of these points have already been referred to, but their full discussion would not be within the scope of this work.

TABLES OF DIFFERENTIAL DIAGNOSIS.

DIAGNOSTIC SYLLABUS OF UTERINE INFLAMMATIONS.

The usual means of diagnosis may be thus arranged to show at a glance what they reveal:—

Means of Diagnosis of Uterine Diseases.[1]

Gen'l symptoms.	Touch.	Speculum.	Probe.
1. Pain: Locality and character. Amount. 2. Leucorrhœa: Character. Amount. Constancy. 3. Menstruation: Regularity. Amount. Pain.	Reveals: 1. Perviousness of vaginal canal. 2. Location, size, density, and tenderness of cervix. 3. Os open or *vice versâ*, soft or *vice versâ*, smooth or rough, moist or dry, enlarged or elongated or atrophied. 4. Presence or absence of hardness or tumefaction of recto-vaginal or cysto-vaginal spaces; also nature of the same. 5. State of ovaries and pelvic areolar tissue determined by lateral and upward pressure. By Conjoined Manipulation. 6. Volume, shape, sensitiveness of uterus, ovaries, broad ligaments, and bladder. By Rectal Touch, double and single: 7. Condition of posterior wall of uterus.	1. Reveals color of mucous membrane of vaginal tract and cervix, and condition of os. 2. Nature of leucorrhœa. 3. Declares atrophy or hypertrophy of cervix. 4. Reveals nature of mucus, abrasions and "ulcerations."	1. Reveals capacity of uterus. 2. Existence of foreign growths. 3. Shows deviations of course of canal, and differentiates them from tumors. 4. Indicates endometritis.

Having thus learned what general information may be obtained by the different means of diagnosis employed in uterine affections, we may now make the application of it to the specific varieties of uterine inflammation. The arrangement in a syllabic group is well calculated to fix in the mind the various symptoms of each affection as thus diagnostically revealed.

[1] Prof. J. H. Etheridge, M.D., Chicago Med. Journal and Examiner Sept. 1876, p. 812.

Diagnostic Syllabus of Varieties of

Means of Diagnosis.	1. Metritis.		2. Cervicitis.	
	Acute. (*Very rare.*)	Chronic.	Acute.	Chronic.
1. General symptoms.	*a.* Violent pelvic pain, accompanied with rectal, vesical, and uterine tenesmus, and sometimes with nausea and vomiting. *b.* Pressure over abdomen reveals great sensitiveness.	*a.* Dull, heavy, dragging pain in pelvis, increased by locomotion. *b.* Defecation and coition painful. *c.* Menses accompanied with pain, which begins several days previous. *d.* Pain in mammæ during and before menstruation. *e.* Darkening of areolæ of the breast. *f* Nausea and vomiting. *g.* Great nervous disturbance. *h.* Pressure on rectum with hæmorrhoids and tenesmus. *i.* Pressure on bladder with vesical tenesmus.	See Acute Metritis.	*a.* Pain in back and loins. *b.* Pressure on bladder or rectum. *c.* Painful and sometimes profuse menstruation. *d.* Difficulty of locomotion. *e.* Nervous disorders. *f.* Pain during sexual intercourse. *g.* Dyspepsia, headache, general lassitude, and debility.
2. Touch.	*a.* Vagina hot and dry, unless from coexisting endometritis there be purulent discharge. *b.* Organ low in pelvis, os enlarged, cervix swollen, pressure on cervix very painful. *c.* Painful tenderness most apparent upon rectal touch and conjoined manipulation.	*a.* Enlargement. *b.* Tenderness.		*a.* Uterus low down. *b.* Cervix large, swollen, and painful, and os may admit finger. *c.* Usually tenderness.
3. Speculum.	*a.* Usually produces too much pain to be used.	Nothing revealed specially.		Confirms signs evinced by touch.
4. Probe.	*a.* Produces intolerable pain, and cannot usually be resorted to.	*a.* Usually reveals some flexion or version, tenderness.		Reveals great sensitiveness before reaching os internum, but nothing beyond that.

Inflammation of the Uterus.[1]

3. Endometritis.		4. Endocervicitis.	
Acute.	Chronic.	Acute.	Chronic.
See Acute Endo-cervicitis.	*a.* Leucorrhœa streaked, glairy, and bloody. *b.* Menstrual disorders. *c.* Pain in back, groins, and hypogastrium. *d.* Nervous disorders. *e.* Tympanitis. *f.* Symptoms of pregnancy. *g.* Sterility.	*a.* Dragging weight and pain in pelvis, pain in back, groin, and thighs. *b.* Rectal and vesical tenesmus. *c.* Purulent discharge sometimes bloody after 3 or 4 days. *d.* Tympanitis and tender abdomen.	*a.* Dragging sensation in the pelvis. *b.* Pain in back and loins increased by exercise. *c.* Profuse, irritating leucorrhœa, like boiled starch. *d.* Menses too scanty or *vice versâ*, too frequent or *vice versâ*. *e.* Nervous, irascible, moody, or even hysterical. *f.* Digestion impaired, ultimately spanæmia, sometimes nausea, etc.
	a. Conjoined manipulation reveals tenderness of fundus.	*a.* Vagina hot and dry, or covered with above discharge. *b.* Os gaping, cervix swollen and tender, body slightly enlarged, whole organ lower in pelvis than normal.	*a.* Os in normal position, may be enlarged, lips puffy, or may be roughened. *b.* Pain results from placing the finger under the cervix and pressing upwards.
	a. Reveals nothing special.	*a.* Cervix puffy, swollen, and red, fluid exuding from os either clear, albuminous looking, muco-pus, or stringy, and tenacious.	*a.* Long, stringy, tough, tenacious mucus, difficult to remove, exuding from os. *b.* Cervix not usually enlarged, may be puffy and swollen and very red, as if ulcerated, due to removal of investing epithelium.
	a. Patulous os internum. *b.* Uterine cavity prolonged. *c.* Tenderness. Withdrawal followed by blood.	*a.* Great tenderness throughout whole organ, and removal followed by a few drops of blood.	*a* Meets with obstruction at os internum. *b.* Does *not* produce pain by striking against the walls of the fundus, nor is its removal followed by blood or mucus.

[1] Prof. J. H. Etheridge, M D., *loc. cit.*

DIAGNOSTIC TABLE OF

	Typhoid Fever.	Typhus Fever.	Relapsing Fever.	Scarlatina.
Mode of invasion.	Often very gradual and ill-defined; patient cannot fix date; no marked rigors; may be only diarrhœa for some time.	Generally well marked, and may be very sudden; usually marked rigors; speedy prostration and high fever.	Generally remarkably sudden; severe rigor; great weakness.	Usually distinct; chilliness, but not severe rigors; rapid pyrexia; may be nervous phenomena, such as convulsions or coma.
Characteristic symptoms.	Marked frontal headache, but other head symptoms not prominent, or only come on at a late period; abdominal symptoms, viz., pain and tenderness, especially in right iliac fossa; tympanitis; gurgling in right iliac region; diarrhœa, with peculiar stools; not uncommonly intestinal hemorrhage; enlarged spleen; no particular prostration; epistaxis not uncommon: tongue peculiar at first; pulse liable to great variations.	Great depression and prostration; dingy and muddy aspect of countenance, with dusky flush on checks, and dull, heavy expression; early and marked head symptoms, and low, nervous phenomena; rapid tendency to typhoid condition; pupils often much contracted.	Sharp frontal headache; severe pains in back and limbs; pains in epigastrium and hypochondriac regions; bilious vomiting, with retching; enlargement of liver and spleen: peculiar aspect of countenance; no marked nervous symptoms usually; much debility, but not prostration; pulse very frequent at an early period; epistaxis and other hemorrhages common.	High pyrexia; flushed face; sore throat, of variable intensity, but always marked; vomiting; "strawberry" tongue; no prominent head symptoms usually; pulse very frequent, generally strong and full.
Skin eruption.	7th to 12th day; generally confined to abdomen, chest, and back; comes out in successive crops, each lasting 2 to 5 days; consists of minute rose-colored spots, slightly raised, disappearing on pressure; only a few visible at the same time; continue to appear until 28th or 30th day, or even later; sudamina not uncommon.	4th or 5th day usually; first about back of wrists, axillæ, or epigastrium; spreads rapidly over the body and limbs, but rarely seen on neck or face; entire eruption out in from 1 to 3 days; consists of: *a*, irregular, dusky-red subcuticular mottling; *b*, maculæ or mulberry spots, deepening in color. and soon not fading on pressure; disappear from 14th to 21st day; skin gives off peculiar odor; sudamina less common than in typhoid.	No specific eruption; sudamina may appear at crisis; oftentime desquamation of cuticle after crisis.	2d day usually; first on neck and upper part of the chest; spreads rapidly to face, and over trunk and limbs; consists of a rash, beginning as minute points, coalescing to form patches or to cover entire surface; color more or less bright red; no elevation generally; reaches height 4th to 5th day, then gradually fades to 9th or 10th day, followed by marked desquamation; often puffiness of face. etc.; much itching and tingling, with burning sensation; sudamina common.

[1] F. T. Roberts, Theory and Practice

THE PRINCIPAL FEVERS.[1]

Measles.	Smallpox.	Varicella.	Erysipelas.
Rather sudden, and generally marked; chilliness or rigors; occasionally convulsions.	Generally sudden; often repeated and strong rigors; rapid pyrexia.	Not marked.	Often gradual, with indefinite febrile symptoms.
Moderate pyrexia; catarrhal phenomena, viz., coryza, etc.; only slight sore throat, if any; more or less catarrh of respiratory passages, extending to bronchi, and increasing during eruptive stage.	High pyrexia; uneasiness or pain in epigastrium; nausea and much vomiting; severe pain in back; much debility and sense of illness; fever rapidly abates when eruption appears, followed by secondary fever; often symptoms pointing to implication of mucous surfaces; erythematous or measly rash may appear, especially in certain parts.	Slight pyrexia, without special symptoms, or may be no symptoms at all.	No special symptoms at early period, but premonitory symptoms of other exanthemata absent; may be much fever; often marked rigor before local phenomena appear; objective signs may be preceded by subjective sensations, as heat, irritation, or by enlargement of lymphatic glands in the neighborhood; in facial erysipelas may have epistaxis at outset; severe symptoms during eruption, with tendency to typhoid condition.
4th day generally; first on face, especially on forehead, then spreads to trunk and limbs, often in three distinct crops on successive days; consists of minute red points at outset, soon enlarging to distinct papules, which tend to form crescentic or semilunar patches; color darker than that of scarlatina; declines in same order in about 12 hours, followed by slight desquamation; reddish or coppery discoloration may remain for some time; much itching.	3d or beginning of 4th day; first on face, especially on forehead; spreads over body and limbs in a day or two, often in successive crops; consists of "pocks" going through stages of: *a*, small, bright-red spot; *b*, hard, shot-like pimple; *c*, vesicle, becoming umbilicated; *d*, pustule, reaching maturation about 8th day; *e*, scab, which leaves reddish-brown stain on separation, or a pit. Hard, inflamed areola forms; very variable mode of arrangement and number; swelling of face, etc.; intense itching; disagreeable odor given off; eruption may be on mucous surfaces.	Within 24 or 36 hours; first about the shoulders and chest, extends over body and limbs, may be many on scalp, but generally few on face; comes out in successive crops for 4 or 5 nights; first, bright red, slightly papular spots, not hard; in few hours vesicular, large, and ill-defined, superficial, not umbilicated, no inflamed areola; do not become pustular, but gradually opalescent, and dry up or rupture 3d to 5th day; usually few in number and scattered; as a rule, no pitting left.	Usually within 2 or 3 days; generally on face and head; signs of rapidly spreading inflammation of skin, from a point usually in one direction, sometimes equally in all; much heat, redness, swelling, and tension, followed by formation of vesicles or bullæ, which rupture or dry up; subsequent extensive peeling of cuticle; may end in suppuration, ulceration, or gangrene; inflammation liable to extend after apparently stopping; may assume erratic or metastatic character; or extend to mouth, throat, larynx, etc.; may affect limbs or other parts.

of Medicine. Philadelphia, 1880.

Diagnostic Table of

	Typhoid Fever.	Typhus Fever.	Relapsing Fever.	Scarlatina.
Degree of pyrexia, and course of temperature.	Peculiar ascent; rise of 2° each evening, with morning remission of 1°, therefore daily rise of 1°; temp. finally reaches to from 104° to 106° in evening, usually with slight morning remission; decline gradual, indicated by more distinct morning remission, followed by slight evening fall, with very considerable morning remission; some time before evening, temp. normal.	Regular ascent without any remission until 4th or 5th evening, up to 104°, 105°, or higher, then usually slight morning remission and marked fall on 7th morning; subsequent rise, but not to former maximum usually; then continuous, with morning remission, varying from 6–10° to 1½°; rapid decline, temperature becoming normal in from 12 to 48 hours.	Continuous ascent for 4 or 5 days; temp. at last reaches 104° to 108°; slight morning remissions; rapid fall at crisis to below normal, with subsequent speedy rise to former temp. or even higher; sudden defervescence again at second crisis.	Continuous ascent until rash attains height; generally reaches 104° to 106°, maybe 108°, or higher; slight morning remission; defervescence may be by crisis, or gradual when eruption begins to fade.
ourse, duration, and terminations.	Continuous; duration usually from 3 to 4 weeks, rarely beyond 30 days; most cases end in recovery; no crisis, but defervescence gradual; convalescence slow, and health liable to remain permanently impaired; relapse not uncommon.	Continuous; duration usually from 14 to 21 days; most cases recover, but mortality varies in different epidemics; generally marked crisis, followed by deep sleep and rapid improvement in symptoms; convalescence is usually comparatively speedy; relapse exceedingly rare.	Peculiar course, viz., sudden crisis usually from 5th to 7th day, attended with profuse sweating and other phenomena, followed by complete or partial cessation of symptoms: from 12th to 17th day sudden relapse, with same symptoms as at first; second crisis generally in from 3 to 5 days; may be a series of relapses; duration variable; almost always recovery, but convalescence often very slow, with debility, anæmia, muscular and arthritic pains, etc., as sequelæ.	Continuous; duration often prolonged on account of desquamation; mortality very variable, but often high; convalescence liable to be retarded by various sequelæ, especially renal disease, with albuminuria and dropsy; very rarely relapse.
Diseases resembling:	Fevers. Typhus fever; relapsing fever; febricula.	Typhoid fever; relapsing fever; measles at early period; erysipelas; febricula.	Typhus fever; typhoid fever.	Measles; rötheln; diphtheria; smallpox in the invasion stage.

the Principal Fevers—continued.

Measles.	Smallpox.	Varicella.	Erysipelas.
Continuous ascent up to height of rash; temp. not usually above 103°; morning remissions slight, marked, or absent; defervescence by rapid crisis from 4th to 10th day; temp. liable to be much influenced by complications.	Rapid rise of temperature to 104°–106°; speedy fall, nearly or quite to normal, when eruption appears; a second rise as the eruption maturates, and varies with the amount of this; temp. reaches 104° or 105° in a typical case; gradual defervescence; may be another elevation of temperature when desiccation occurs.	No special course; pyrexia usually slight; may be marked rise of temp. in the evenings.	Very variable course, according to part affected; in facial erysipelas, rapid rise of temp.; when local inflammation appears, may reach 104° or 105° on first evening; increases so long as inflammation extends, but usually reaches maximum on 3d day; may be 106°–108°; generally evening exacerbations, but may be distinct fall; defervescence usually about 5th or 6th day of inflammation; as a rule, by rapid crisis; temp. normal in 12 to 36 hours; may be more gradual; temp. will rise with relapse or extension of inflammation; is much influenced by complications.
Continuous; duration usually within a fortnight; most cases recover; termination generally by rapid crisis; very rarely relapse.	Course and duration very variable; termination fatal in large proportion of cases, about 1 in 3; recovery is gradual, and convalescence often much delayed.	Short duration; never fatal; generally speedy recovery.	Variable duration; termination not uncommonly fatal; when favorable, usually marked crisis; convalescence established in variable time.
Scarlatina; rötheln; smallpox (at early stage of eruption); typhus fever; influenza (in the invasion stage).	Febricula; varicella; measles (in early stage of eruption).	Smallpox.	Typhus fever.

Diagnostic Table of

	Typhoid Fevor.	Typhus Fevor.	Relapsing Fever.	Scarlatina.
Diseases resembling:	Other diseases. Acuto tuberculosis; tubercular meniugitis; pneumonia; pyræmia; renal disease, with uræmia; gastroenteritis; chronic peritonitis, with ulceration of the bowels.	Asthenic pneumonia, especially in old, feeble, or intemperate persons; cerebral or meningeal inflammation; certain cases of dolirium tremens; blood-poisoning from uræmia, pyæmia, or septicæmia.	Rheumatic fever; gastric or hepatic affections.	Acute throat inflammation; roseola; urticaria; erythema; a rash like that of scarlatina is sometimes seen in surgical cases.
Remarks.	Cases of typhoid fever are liable to be very obscure, and present considerable differences in their clinical history; care is therefore necessary in diagnosis; when there is persistent diarrhœa, always bear in mind typhoid fever, and use the thermometer; patients may walk about during the entire attack; the most important complications are perforation of the bowel and peritonitis; more or less bronchial catarrh is always present.	Typhus fever can be generally recognized without much difficulty; it differs from typhoid not only in the points indicated in the table, but also in frequently attacking persons beyond middle life, and being much influenced by unfavorable hygienic conditions, which probably may even originate the disease *de novo*; there is a great liability to hypostatic congestion.	Relapsing fever is most liable to be mistaken for typhus at first, but the difference indicated above ought to enable the diagnosis to be made; the two diseases are promoted by the same anti-hygienic conditions; among the most distinctive complications are abortion and a peculiar form of ophthalmia.	Scarlatina presents several important varieties; there may be no rash at all, and cases may present very slight symptoms; on the other hand, these may be of a very malignant character, ending in speedy death, making the diagnosis very difficult; the occurrence of scarlatina may only be known by desquamation taking place, or renal disease setting in.

the Principal Fevers—concluded.

Measles.	Smallpox.	Varicella.	Erysipelas.
Roseola; syphilitic exanthem; fleabites.	Lichen (at early period); pustular syphilitic eruption.	....	Acute eczema; erythema.
Measles may occur without its eruption, or without its catarrhal symptoms; there are also malignant varieties, difficult to recognize.	Smallpox presents many varieties, especially as regards the eruption, and this is greatly modified by vaccination; it is even believed that there may be no eruption; malignant forms of the disease are also met with, hence diagnosis may be difficult; the greatest difficulty lies in distinguishing mild cases from those of chicken-pox; the occurrence of the prodromal rashes is important in the diagnosis of early cases of smallpox.	....	Cases of erysipelas are often very difficult to recognize at the outset; the complaint might be suspected if there were febrile symptoms, without any of the premonitory signs of other fevers, or any symptoms pointing to local disease, especially if accompanied with any unusual and subjective sensations about the face or other parts, or if lymphatic glands seem to be inflamed; the fact of a patient having had previous attacks of erysipelas may help in foretelling a coming one.

DIAGNOSTIC TABLE OF ACUTE

	Broncditis.	Croupous Pneumonia.
1. Mode of Invasion.	Coryza and other symptoms of "cold." Not marked rigors, but only slight and repeated chills, if any.	A single, severe, prolonged rigor at the outset usually.
2. Sensations about the chest.	Soreness, heat, or rawness behind the sternum. Muscular pains from cough. Feeling of oppression.	Pain in the side frequently, not stitchlike, but more dull and diffused.
3. Cough.	In paroxysms, ofteu severe.	Considerable, aud in paroxysms.
4. Expectoratiou	Abundant; changes its character as the case progresses from mucous to muco-purulent, etc.	Considerable; viscid, tenacious, aud "rusty."
5. Disturbance of breathing.	Seuse of dyspnœa in proportion to the exteut of the disease; may be extreme. Pulse-respiration ratio not proportionately altered.	Very rapid breathing, and mnch perversion of pulse-respiration ratio, but not proportionate feeling of dyspnœa.
6. Degree of pyrexia.	Often absent or slight, aud temperature rarely above 100° to 102°. Skin moist.	Considerable; temperature usually high, 103°, 104°, 105°, or more, and runs a regular course. Skiu acridly hot and dry.
7. Aspect of the patient, and geueral condition.	Tendency to cyanosis if the disease is extensive. In some cases adynamic symptoms set in.	Marked flushing of face, often unilateral. Not cyanotic. Usually great prostration.
8. Physical sigus.	Various dry and mucous râles and rhonchal fremitus. Signs of obstruction of bronchial tubes in some cases. More or less bilateral. Mucous râles chiefly towards bases; dry rhonchi at upper part of chest.	At first crepitant rhonchus; followed by signs of consolidation, viz., diminished movement; increased by vocal fremitus; dulness; bronchial or tubular breathing; increased and metallic vocal resonance; finally signs of resolution. Usually one base is affected. The side is not notably enlarged; nor is there any displacement of orgaus.
9. Course and termination.	Variable. No crisis. Tendency to death by apnœa or adynamia iu capillary bronchitis.	Often a marked crisis, and disease ends within a certain period.

[1] F. T. Roberts, Theory and Practice

PULMONARY DISEASES.[1]

Catarrhal Pneumonia.	Pleurisy.	Acute Phthisis.
Generally occurs after bronchitis or collapse, and without distinct rigors.	Several moderate rigors or slight chills, if any. Invasion may be very insidious.	Follows acute pneumonia, bronchitis, or catarrhal pneumonia, or begins with severe rigors, often repeated.
Pains about the chest often, but not specially localized.	Severe stitch-like pain in the side.	Generally pains in various parts of the chest.
Short, hacking, and painful.	Slight, and patient tries to repress it.	Frequent and violent fits.
Often less than before, not "rusty."	Absent or very slight, and of no special characters.	Abundant; either bronchitic, or sometimes "rusty," or attended with hæmoptysis.
Rapidity of breathing increased when the complaint follows bronchitis; but feeling of dyspnœa may be less.	Quick, shallow breathing at first, but less disturbance of pulse-respiration ratio than in pneumonia. Later on more or less actual dyspnœa.	Great dyspnœa, and very hurried breathing, especially in the tubercular form.
Temperature high, but there are considerable remissions at irregular intervals.	Not great, and no regularity in course of temperature. Skin not acridly hot.	Often very high, especially in the tubercular form, but no regularity in temperature.
The face is usually flushed. Often much anxiety and restlessness, with loss of flesh and strength.	Nothing special. No particular prostration, or tendency to cyanosis.	Severe prostration and weakness, with profuse perspiration and rapid wasting. In the tubercular form extreme adynamia.
There may be signs of consolidation in scattered spots with râles. Both lungs are usually involved in irregularly scattered patches. When the disease follows extensive pulmonary collapse, there may be a peculiar pyramidal form of dulness.	At first friction-sound or fremitus; succeeded by signs of fluid, viz., side often enlarged; movements interfered with; diminished vocal fremitus; dulness occasionally movable; weak or suppressed breathing and vocal resonance; egophony sometimes; and displacement of organs: finally, signs of absorption, with redux friction-sound or fremitus. Usually on one side.	At first merely signs of bronchitis; followed by consolidation, softening, or excavations in different parts, especially towards the bases. In the tubercular form frequently scattered râles constitute the only physical signs.
No crisis, and course often prolonged.	No crisis, and course very variable.	Generally very rapid course, and fatal termination.

of Medicine. Philadelphia, 1880.

DIAGNOSTIC TABLE OF THE MORE

Symptoms.	Acute Laryngitis.	Chronic Laryngitis.	Tubercular Laryngitis.
SUBJECTIVE—			
Voice . . .	Hoarse, sometimes aphonic.	Hoarse, faltering, easily fatigued.	Hoarseness of peculiar character; aphonic in later stages.
Respiration .	Not embarrassed except when œdema is present, then dyspnœa.	Not embarrassed.	Hurried; embarrassed in later stages.
Cough . .	Dry and hard; later moist.	Hacking, with starchy expectoration.	Painful; amount and character depending upon the lung implicated.
Deglutition .	Usually painful.	Not interfered with.	Difficult and painful.
Pain . . .	Feeling of constriction and acute pain.	Feeling of fulness.	Only in deglutition and phonation.
PHYSICAL—			
Color . . .	Uniformly intense red.	Partially increased.	Grayish red.
Form and texture . .	Swelling in œdema.	Abrasions.	Swelling of mucous membrane, ulcers, and pyriform swelling of arytenoid cartilages.
Position . .	Unaltered.	Unaltered.	Usually no displacement.
External .	Pharynx implicated.	Pharynx implicated.	Pharynx involved—physical signs of lung disease.
CAUSE . . .	Exposure to draft. Imbedded foreign bodies or corrosive substances.	Impure air; abuse of voice.	Same as of lung affection.
PROGNOSIS . .	Favorable except in œdema.	Favorable.	Unfavorable.

[1] Carl Seiler, Handbook of Diagnosis and Treatment

COMMON DISEASES OF THE LARYNX.

Syphilitic Laryngitis.	Benign Growths.	Malignant Growths.	Functional Diseases.
Hoarse, seldom aphonic.	Variable, from slight hoarseness to aphonia.	Variable.	Aphonic in bilateral paralysis; hoarse in other forms of paralysis.
Not usually embarrassed.	Embarrassment depends upon situation of growth.	Quickened and paroxysmal.	Embarrassed in paralysis of abductor.
Slightly hacking.	Not severe; occasional expectoration of parts of growth.	Not severe; occasional expectoration of parts of growth.	Paroxysmal in spasmodic affections.
Unimpaired, unless epiglottis or arytenoids are ulcerated.	Impaired when growth is situated on epiglottis or ary-epiglottic fold.	Difficult and painful.	Not generally affected.
Absent.	Absent.	Severe.	Not usually present.
Brick-red in symmetrical patches.	Variable with nature of the growth.	Livid.	Normal.
Ulcerations and specific neoplasms.	Variable; no ulcers.	Depends upon size and nature of the growth; large ulcers.	Form of glottis changed.
Unaltered except when changed by cicatrices of ulcers.	Normal parts seldom changed.	Displacement by infiltration.	No displacement.
Pharynx, velum, and skin implicated.	None.	Glands implicated—cancerous cachexia.	Other organs may be affected.
Primary sore.	Uncertain.	Primary cancer in other parts.	Cerebr'l disease, hysteria, acute and chronic laryngitis.
Favorable.	Depends upon size and position of growth.	Unfavorable.	Favorable when cerebral disease is absent.

of Diseases of the Throat, &c. Philadelphia, 1879.

DIAGNOSTIC TABLE OF THE MORE COM-

Symptoms.	Acute Pharyngitis.	Chronic Pharyngitis.	Syphilitic Pharyngitis.
SUBJECTIVE—			
Voice . . .	Usually hoarse, with thick articulation.	Normal, unless larynx is implicated, then hoarse and easily fatigued.	Normal, or slightly hoarse; articulation nasal if velum or uvula is ulcerated.
Respiration .	Not interfered with, except when tonsils are touching each other.	Not interfered with.	Not affected.
Cough . .	Hacking; later moist.	Dry, but slight, white, stringy expectoration.	Variable.
Deglutition .	Difficult and painful if tonsils and glands are implicated.	Not affected.	Difficult according to position of ulcers.
Pain . . .	Severe lancinating.	Sense of dryness and burning.	Usually absent.
PHYSICAL—			
Color . . .	General redness of mucous membrane.	Generally diminished, with prominent veins.	Brick-red, symmetrical patches.
Form and texture . .	Not changed.	Mucous membrane dry and shining.	More or less deep ulcers on pharynx, velum, and tonsils.
External .	Larynx implicated.	None.	Skin implicated.
CAUSE . . .	Exposure to cold.	Bad air, alcoholism, masturbation.	Primary sore.
PROGNOSIS . .	Favorable.	Favorable.	Favorable.

[1] Seiler.

MON DISEASES OF THE NASO-PHARYNX.

Granular Pharyngitis.	Tonsillitis.	Nasal Polypi.	Post-nasal Catarrh.
Usually hoarse from laryngeal implication; articulation normal.	Normal; articulation thick.	Normal; articulation nasal.	Normal; articulation more or less nasal.
Not affected.	Affected only in severe cases.	Respiration through nose more or less obstructed.	Respiration through nose affected, especially in recumbent position.
Often severe and dry, with little expectoration.	Slight.	Absent.	Slight, with expectoration of thick, tenacious mucus.
Not affected.	Almost impossible and very painful.	Not affected.	Not affected.
Sense of dryness and fulness.	Severe.	Usually absent.	Frontal headache; sense of dryness in nose and pharynx.
Usually paler than normal.	Tonsils appear livid.	General hyperæmia of nasal mucous membrane.	Paler than normal.
Red nodules and prominent veins on surface of pharynx resembling granulation.	Great tumefaction of the glands.	Depends upon character of polypus.	Tumefaction of mucous membrane, shallow ulcers.
None.	Implication of cervical and submaxillary glands.	Stoppage of nose; dryness of mouth and pharynx; bleeding from nose.	Stoppage of nose, often watery discharge; slight depression of bridge of nose.
Abuse of voice; gastric derangement.	Exposure to cold.	Uncertain.	Vitiated air and changeable climate.
Favorable.	Favorable in most cases.	Favorable.	Favorable.

op. cit.

DIFFERENTIAL DIAGNOSIS OF FRACTURES THE HIP

	INTRA-CAPSULAR FRACTURE.	EXTRA-CAPSULAR FRACTURE.
I. Age.	Most apt to occur in advanced life; after 55 years.	May occur at any period of life.
II. Cause.	Usually result of *slight* cause.	Usually caused by *direct* and *severe* violence.
III. Condition of Limb.	*Shortening;* at first is *slight*, but apt to *increase* to 2 to 2½ inches. Is readily *effaced* by extension and counter-extension, but *recurs* the moment the force is discontinued.	Great *shortening* at first, and continues about 1½ to 2 inches. May be *effaced*, but *returns* upon discontinuance of force.
IV. Crepitation.	Crepitation indistinct.	Crepitation very distinct.
V. Mobility.	Preternatural mobility.	Preternatural mobility.
VI. Position of Knee.	Everted.	Everted.
VII. Position of Foot.	Strongly everted.	Everted.
VIII. Position of Great Trochanter.	Moves freely with leg, as it were, on a pivot.	Preternatural mobility.
IX. Position of Gluteo-Femoral Crease.	Nearly normal.	Higher than normal.
X. Position of Head of Femur.	Cannot be distinguished except in very thin persons.	Cannot be felt.
XI. Vacuity.	No vacuity over acetabulum.	No vacuity.

* Tabulated by H. Augustus Wilson, M.D., of Philadelphia,

AND DISLOCATIONS OF THE FEMUR AT JOINT.*

ILIAC DISLOCATION.	SCIATIC DISLOCATION.	PUBIC DISLOCATION.	THYROID DISLOCATION.
Adult life.	Adult life.	Adult life.	Adult life.
Always produced by *severe* violence.	Produced by *severe* violence.	Produced by *severe* violence.	Produced by *severe* violence.
Shortening $1\frac{1}{2}$ to $2\frac{1}{2}$ inches. *Only effaced* by reduction. Does *not then return.*	*Shortening* $\frac{1}{2}$ to 1 inch. *Only effaced* by reduction. Does *not then return.*	*Shortening* $\frac{3}{4}$ to 1 inch. Only effaced by reduction. Does *not return.*	*Lengthening* $1\frac{1}{2}$ to $2\frac{1}{2}$ inches.
No crepitation.	No crepitation.	No crepitation.	No crepitation.
Immobility. Limb in a fixed and constrained position.	Immobility. Limb in a fixed and constrained position.	Immobility. Limb in a fixed and constrained position.	Immobility. Limb in a fixed and constrained position.
Overlaps its fellow.	Inverted.	Everted.	Stands out and away from its fellow.
Inverted; big toe pointing toward opposite tarsus.	Foot inverted; big toe pointing toward great toe of opposite side.	Everted.	Straight.
Higher than normal.	Higher and further back than normal.	Higher and nearer median line in front.	Lower than normal.
Higher.	Higher.	Higher.	Lower.
Can be distinctly felt on dorsal surface of ilium.	Is buried in sciatic foramen; cannot always be felt.	Easily felt over pubes.	Is in thyroid foramen; can sometimes be felt.
Vacuity.	Vacuity.	Vacuity.	Vacuity.

in the *Annals of Anatomy and Surgery*, 1881.

DIFFERENTIAL DIAGNOSIS OF CARDIAC VALVULAR LESIONS.[1]

Lesion.	Characters of the Murmur.			Effects of the Lesion on the Heart and Circulation.								
	Points of differential maximum intensity.	*Rhythm.*	*Directions of propagation.*	*Left ventricle.*	*Left auricle.*	*Lungs.*	*Pulmonary second sound.*	*Right ventricle.*	*Tricuspid valve.*	*Right auricle.*	*Systemic venous circulation.*	*Arterial circulation; pulse.*
Mitral stenosis.	Apex, which is normal.	Presystolic.	Downward and inward to a limited extent.	Normal or small.	Dilated and hypertrophied.	Engorged lung symptoms.	Accentuated.	Hypertrophied and dilated.	Towards end may be incompetent.	Dilated and hypertrophied	Engorged; dropsy; face blue and effects of engorgement of stomach, liver, kidneys, brain, etc.	Small, weak, unequal in volume, irregular in time.
Mitral regurgitation.	Apex, which is displaced downward and outward.	Systolic.	Upward and outward to left axilla, and inferior angle of left scapula.	Hypertrophied and dilated.	Dilated and hypertrophied.	Engorged lung symptoms.	Accentuated.	Hypertrophied and dilated.	Towards end may be incompetent.	Dilated and hypertrophied	Engorged; dropsy; face blue and effects of engorgement of stomach, liver, kidneys, brain, etc.	Small, weak, and irregular in time.
Aortic stenosis.	Second right costal cartilage.	Systolic.	Upward along course of aorta and into vessels of neck.	Hypertrophied.	Normal.	Normal.	Normal.	Normal.	Normal.	Normal.	Normal.	Small, regular, and of good strength.
Aortic regurgitation.	Second right costal cartilage, middle sternum, lower end sternum.	Diastolic.	Downward to lower end of sternum.	Hypertrophied and dilated.	Normal so long as mitral valve is sound.	Normal so long as mitral valve is sound.	Normal so long as mitral valve is sound.	Normal so long as mitral valve is sound.	Normal so long as mitral valve is sound.	Normal so long as mitral valve is sound.	Normal so long as mitral valve is sound; face pale.	Jerking, visible, collapsing and tortuous.
Tricuspid regurgitation (usually secondary).	Lower end of sternum.	Systolic.	Upward and outward toward right.	Normal if lesion is primary.	Normal if lesion is primary.	Normal or anæmic if lesion is primary.	Weak if lesion is primary.	Hypertrophied and dilated.	Incompetent.	Dilated.	Engorged; venous pulsation in neck, dropsy, etc.	Small, weak, irregular.

[1] By Byron Bramwell, M.D., Lecturer on Medicine in Extra Academical School, Edinburgh, Scotland, in *London Lancet*.

DIAGNOSTIC SYLLABUS OF TUMORS OF THE GROIN.[1]

Diagnosis of Inguinal Tumors.

HERNIA.—Impulse on coughing; reducible with gurgle; clear on percussion if intestine; feels like intestine, or knotty, if omentum.

HYDROCELE OF CORD.—Impulse on coughing; apparently reducible; dull on percussion; elastic feel, like small elongated bag of fluid.

ILIAC ABSCESS.—Impulse on coughing; non-reducible; dull on percussion; elastic, and possibly fluctuating.

LYMPHADENOMA.—No impulse on coughing; non-reducible; dull on percussion; hard, well-defined, not tender unless inflamed.

TESTIS.—No impulse on coughing; non-reducible; dull on percussion; obscurely elastic, and characteristically painful.

Diagnosis of Femoral Tumors.

HERNIA.—Impulse on coughing; reducible with gurgle; clear on percussion if intestinal; feels like intestine, or knotty, if omentum.

PSOAS ABSCESS.—Impulse on coughing; irreducible; dull on percussion; elastic or fluctuating.

FATTY TUMOR.—No impulse; irreducible; dull; lobulated.

[1] Extract from a lecture by Christopher Heath, F.R.C.S., in Medical Times and Gazette of London.

Cyst in Canal, or Lymphadenoma.—No impulse; irreducible; too small for percussion; hard and ill-defined.

Reducible Scrotal Tumors.

Hernia.—Impulse on coughing; percussion clear if intestinal, dull if omental; ring and inguinal canal occupied, spermatic cord obscured; intestine to be felt, and returned with gurgle, and remains up till effort is made; opaque; any age.

Congenital Hydrocele.—No impulse unless combined with hernia; percussion dull; ring and canal clear; fluid to be felt, and readily returned when patient lies down, and reappears slowly when he stands up; translucent; childhood.

Varicocele.—Impulse on coughing when large; percussion dull; ring occupied by enlarged spermatic cord; feels like a bag of worms when small, but like intestine when large—can be reduced by pressure, and fills again while pressure is made on ring; opaque; young adult, and on left side.

Irreducible Scrotal Tumors.

Hernia. — Sausage-shape; intestine clear, omentum dull; intestinal or knotty; opaque; sudden.

Hydrocele.—Pyriform; dull on percussion; elastic or fluctuating; translucent; chronic.

Hæmatocele.—Globular; dull on percussion; tense or doughy; opaque; sudden.

Sarcocele.—Irregular; dull on percussion; more or less induration; opaque; chronic.

Strangulated Hernia.—Suddenly produced, or, if present before strangulated thus; pain in groin and about abdomen, with considerable constitutional depression and

anxiety of face; tumor tense, and giving the sensation of intestine when manipulated—skin normal; impulse on coughing to be felt along the groin, in which there is more fulness than usual, but ceases abruptly at the point of strangulation; percussion over tumor gives a clear sound unless the protrusion is omental; vomiting probably present, continuous, and eventually stercoraceous.

HÆMATOCELE.—Suddenly produced by some external violence; pain in scrotum and constitutional disturbance, slight after the first few minutes; tumor tense and heavy, globular in shape, and not translucent—skin often bruised; no impulse in groin, which is perfectly normal; percussion gives a dull note; vomiting immediately following the accident, but not continued.

ORCHITIS.—Developed a few hours after a blow or following gonorrhœa; pain in scrotum and along the cord to the loins—feverish disturbance of system; tumor excessively tender to the touch—cord thickened—skin reddened; no impulse on coughing; percussion gives a dull note; nausea and faintness, but seldom vomiting.

OBSTETRIC MEMORANDA.

Under this head may be mentioned several items of practical interest to the obstetrician, such as the method of calculating the date of labor, the various presentations and positions, and the measurements of the pelvis and fœtal head.

Calculation of the Date of Labor.

The following carefully-prepared table is a valuable aid to the obstetrician in fixing an approximate date for the termination of pregnancy. The duration of human pregnancy is about 275 days. As labor occurs in the larger proportion of cases between 270 and 290 days from the last menstruation, it is usual to reckon either from the first or last day of this period, taking as the mean 280 days, or a little over nine calendar months. For this approximate calculation, the first day of the menstrual period may be used as being more readily ascertained. The table presents at a glance the beginning and end of 280 days for every day of the year. Find the date of menstruation in the upper line of the horizontal row, and the figure below, with the corresponding month, will indicate 280 days. In leap year, if the period of pregnancy includes February, the time for labor will be one day earlier than that given in the table.[1]

[1] This table, with explanatory remarks, was prepared by W. W. Ely, M.D., of Rochester, N. Y., for the Medical Register of New York, New Jersey, and Connecticut, Dr. A. E. M. Purdy, Editor, N. Y. 1876.

The Duration of Pregnancy.

Jan. .	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Oct. .	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	*Nov.*
Feb. .	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28				
Nov. .	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5				*Dec.*
March	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Dec. .	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	*Jan.*
April .	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
Jan. .	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4		*Feb.*
May .	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Feb. .	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	*March.*
June .	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
March	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6		*April.*
July .	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
April .	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	*May.*
Aug. .	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May .	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	*June.*
Sept. .	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
June .	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	21	25	26	27	28	29	30	1	2	3	4	4	6	7		*July.*
Oct. .	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
July .	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	*Aug.*
Nov. .	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
Aug. .	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6		*Sept.*
Dec. .	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Sept. .	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	*Oct.*

Diameters of the Female Pelvis.

The diameters of the pelvis may be stated as follows:[1]—

Antero-posterior, taken *at the brim*, from the upper part of the posterior surface of the symphysis pubis to the centre of the promontory of the sacrum; *in the cavity*, from the centre of the symphysis pubis to a corresponding point in the body of the third piece of the sacrum; and *at the outlet*, from the lower extremities of the symphysis pubis to the tip of the coccyx.

Oblique, taken *at the brim*, from the sacro-iliac joint on either side to a point of the brim opposite the ilio-pectineal eminence (that starting from the right sacro-iliac joint being called the right oblique, that from the left the left oblique); *in the cavity*, a similar measurement at the same level as the conjugate; while *at the outlet*, an oblique diameter is not usually measured.

Transverse, taken *at the brim*, from a point midway between the sacro-iliac joint and the ilio-pectineal eminence; *in the cavity*, from corresponding points in the same plane as the conjugate and oblique diameters; and *at the outlet*, from the centre of the inner border of one ischial tuberosity to the other.

The *average measurements* are the following:—

	Antero-posterior.	Oblique.	Transverse.
Brim	4.25 inches.	4.8 inches.	5.2 inches.
Cavity . . .	4.7 "	5.2 "	4.75 "
Outlet . . .	5.0 "	—	4.2 "

[1] The facts here detailed are extracted from the recent work of Dr. W. S. Playfair, of London, on the Science and Practice of Midwifery, Philadelphia, 1876, p. 33, etc.

Diameters of the Fœtal Skull.

These are measured from corresponding points opposite each other, and may be briefly stated as follows:—

Occipito-mental, from the occipital protuberance to the point of the chin, 5.25″ to 5.50″.

Occipito-frontal, from the occiput to the centre of the forehead, 4.50″ to 5″.

Sub-occipito-bregmatic, from a point midway between the occipital protuberance and the margin of the foramen magnum to the centre of the anterior fontanelle, 3.25″.

Cervico-bregmatic, from the anterior margin of the foramen magnum to the centre of the anterior fontanelle, 3.75″.

Transverse or *bi-parietal*, between the parietal protuberances, 3.75″ to 4.″

Bi-temporal, between the ears, 3.50″.

Fronto-mental, from the apex of the forehead to the chin, 3.25″.

Presentations and Positions of the Fœtus.

Head Presentations.—The *positions* of the fœtal head after it has entered the brim, are—

First, or *left occipito-cotyloid.* The occiput points to the left foramen ovale, the sinciput to the right sacro-iliac synchondrosis, and the long diameter of the head lies in the right oblique diameter of the pelvis.

Second, or *right occipito-cotyloid.* The occiput points to the right foramen ovale, the forehead to the left sacro-iliac synchondrosis, and the long diameter of the head lies in the left oblique diameter of the pelvis.

Third, or *right occipito-sacro-iliac.* The occiput points to the right sacro-iliac synchondrosis, the forehead to the

left foramen ovale, and the long diameter of the head lies in the right oblique diameter of the pelvis. (This position is the reverse of the first.)

Fourth, or *left occipito-sacro-iliac.* The occiput points to the left sacro-iliac synchondrosis, the forehead to the right foramen ovale, and the long diameter of the head lies in the left oblique diameter of the pelvis. (This position is the reverse of the second.)

Pelvic Presentations.—The *positions* of breech presentations may be divided as follows:—

First, or *left sacro-anterior* (corresponding to the first position of the vertex). The sacrum of the child points to the left foramen ovale of the mother.

Second, or *right sacro-anterior* (corresponding to the second vertex position). The sacrum of the child points to the right foramen ovale of the mother.

Third, or *right sacro-posterior* (corresponding to the third vertex position). The sacrum of the child points to the right sacro-ilac synchondrosis of the mother.

Fourth, or *l·ft sacro-posterior* (corresponding to the fourth vertex position). The sacrum of the child points to the left sacro-iliac synchondrosis of the mother.

Face Presentations.—The *positions*, classified according to the part of the pelvis to which the chin points, may be stated as follows:—

First. The chin points to the right sacro iliac synchondrosis, the forehead to the left foramen ovale, the long diameter of the face lies in the right oblique diameter of the pelvis. (This corresponds to the first vertex position.)

Second. The chin points to the left sacro-iliac synchondrosis, the forehead to the right foramen ovale, and the long diameter of the face lies in the left oblique diameter

of the pelvis. (This is the conversion of the second vertex position.)

Third. The forehead points to the right sacro-iliac synchondrosis, the chin to the left foramen ovale, and the long diameter of the face lies in the right oblique diameter of the pelvis. (This is the conversion of the third vertex position.)

Fourth. The forehead points to the left sacro-iliac synchondrosis, the chin to the right foramen ovale, and the long diameter of the face lies in the left oblique diameter of the pelvis. (This is the conversion of the fourth vertex position.)

SHOULDER PRESENTATIONS.—These include two divisions, those in which the back of the child looks to the abdomen of the mother, and those in which the back of the child is turned towards the spine of the mother. Each of these is subdivided into two classes, according as the head of the child is placed in the right or left iliac fossa. In dorso-anterior positions, if the head lie in the left iliac fossa, the right shoulder of the child presents; if in the right iliac fossa, the left. In dorso-posterior positions, if the head lie in the left iliac fossa, the left shoulder presents; if in the right, the right.

BRIEF RULES FOR CLINICAL EXAMINATION OF THE URINE.

The following rules for the examination of a specimen of urine will be found of value to the practitioner as a guide to the proper method of investigating the abnormal conditions of that fluid.[1]

1. *Color.*—Whether pale from being dilute, dark from being concentrated, dark or greenish from presence of bile, smoky from blood.

2. *Smell.*—Fragrant from the existence of cystin, or sugar, etc., or fetid from alkalinity.

3. *Quantity passed* in twenty-four hours, to be measured; observe whether there is excess or diminution.

4. *Specific Gravity.*—Take the specific gravity, if possible, of the mixed urine. Normal sp. gr. 1020. If high, suspect sugar; if low, suspect albumen.

5. *Reaction.*—If acid, is it normally so or not? If excessively acid, examine for crystals of uric acid. If alkaline, ascertain whether the alkali is fixed or volatile.

6. *Heat.*—Heat a portion in a test-tube. If a precipitate appear, it may be albumen or phosphates. Add a drop or two of nitric or hydrochloric acid. If precipitate dissolve, *phosphates;* if not, *albumen.* If a deposit disappear on heating, we have *urates.* If it do not disappear, add a drop of nitric acid. If now dissolved, we have *phosphates;* if not, *cystin.*

7. *Bile.*—Test for bile pigment and bile acids, if necessary.

[1] Arranged and condensed from J. Hughes Bennett's Text-Book of Physiology, pp. 478–485; Philadelphia, 1873.

8. *Sugar.*—Test for sugar, if necessary.

9. *Chlorides.*—Add a drop of nitric acid, and then nitrate of silver, *until a precipitate ceases to form.* Thus estimate the average of *chlorides.*

Microscope.—Examine for blood, pus, cystin, oxalate of lime, leucin, tyrosin, tube-casts, etc.

Mode of Detection of Abnormal Constituents of the Urine.

The abnormal constituents of the urine are the following: albumen, bile acids and pigment, acetic, lactic, and butyric acids, fat, sugar, kiestein, leucin, tyrosin, allantoin, sulphuretted hydrogen.

ALBUMEN.—1. *Heat.*—If the urine be alkaline to test-paper, or neutral, add a few drops of acetic or nitric acid; if very acid, neutralize with a little dilute ammonia. Boil a small quantity in a test-tube. If albumen be present, urine becomes turbid if the heat exceeds 154° Fahr.; if albumen abundant, distinct coagulation occurs. If the urine before examination is too acid or too alkaline, coagulation will be prevented by the union of the albumen with the acid or the alkali respectively. In some varieties of urine, boiling produces a precipitate of earthy phosphates, which dissolve on the addition of a little dilute nitric acid.

2. *Nitric Acid.*—This acid produces white turbidity when albumen is present in small quantity; distinct coagulation, if in large quantity. If soluble nitrate of albumen is formed, no coagulation occurs; if nitrate of urea be precipitated, the microscope will detect it. If the patient has been taking copaiva, cubebs, or other oleaginous or oleo-resinous medicines, the urine may be turbid, but the turbidity does not sink, but remains for hours suspended in the fluid.

It is better to employ both heat and nitric acid than either alone.

3. *Ferrocyanide of Potassium.*—Add to a well-filtered urine, acidulated with acetic acid, a weak solution of the ferrocyanide (gr. v to f℥j); a white precipitate occurs, but if there is much mucus in the urine, the test is not serviceable.

Sugar.—Sugar in excess in the urine is grape sugar, often termed diabetic sugar. The urine in diabetes is usually light-colored, froths readily when poured from vessel to vessel, and has a high specific gravity. To obtain the sugar, evaporate the urine to syrupy consistence, and allow the sugar to crystallize out. Separate from it the urea and extractive matters by absolute alcohol, and add to the residue spirits of wine to dissolve the sugar, which is allowed to separate, and the crystalline masses are then purified from alcohol by repeated re-crystallizations from water.

The *tests for sugar* in the urine are the following:—

1. *Moore's Test with Caustic Potash.*—Add to the urine an equal bulk of solution of caustic potash, and boil. If sugar be present, a dark sherry color will be obtained; if in large quantity, a dark purple, sometimes almost black. The caustic potash, unless freshly prepared, may be contaminated with lead of glass bottle, producing a sulphide of lead when added to urine.

2. *Trommer's Test with Sulphate of Copper and Caustic Potash.*—This test depends on the fact that diabetic sugar has the property of reducing cupric to cuprous oxide; but an excess of urates or the protein compounds occasionally present in urine unfortunately have the same property. We may be sure that diabetic sugar is present if cupric oxide be thus reduced *in the cold.* The process is to add to the urine a few drops of solution of sulphate

of copper; to this add a little caustic potash. A greenish-blue precipitate of hydrated cupric oxide results, which is dissolved in an excess of the caustic potash, forming a blue liquid. Heat this by applying the flame of a lamp to the upper stratum; if sugar be present, a yellow, or orange, or red precipitate of cuprous oxide will be formed, in marked contrast to the blue liquid at the bottom of the test-tube.

3. *Fehling's Test with Potassio-cupric Tartrate.*—This compound is made by dissolving 34.65 grammes of pure crystallized sulphate of copper in about 160 grammes of water. This solution is gradually poured into a solution of 173 grammes of pure crystallized double tartrate of potash and soda, treated with from 600 to 700 grammes of caustic potash of 1.12 sp. gr. The clear mixture is then diluted up to a litre. When a few drops of this potassio-cupric tartrate solution are added to the urine, and the upper stratum boiled, the cupric oxide in the alkaline tartrate is reduced to the cuprous oxide, if sugar be present, as in Trommer's test. Ten cubic centimetres of the alkaline solution are reduced by exactly 0.05 gramme of diabetic sugar. Fehling's solution is, however, liable to decomposition, even if kept for only a week, and sometimes gives uncertain results.

4. *Böttcher's Test with Nitrate of Bismuth.*—Add to the urine an equal volume of a solution of one part of crystallized carbonate of soda to three parts of water, and afterwards a little trisnitrate of bismuth, and boil. If sugar be present, the white powder will become dark, the oxide of bismuth being reduced by the sugar. Any albumen in the urine should first be got rid of by boiling and filtration, otherwise the sulphur of the albumen may form the black sulphide of bismuth.

5. *Dichloride of Tin Test.*—Moisten a few strips of me-

rino in a solution of stannous chloride, and dry in a water-bath. On moistening one of these strips with diabetic urine, and holding it near the fire, a brownish-black color results.

6. *Fermentation Test.*—Ordinary yeast is mixed with water, and a long test-tube filled with the suspected urine, to which some of the yeast has been added. Invert the tube over a saucer containing the urine under examination, so that no air may enter, and set the whole aside in a warm place. Sugar, if present, will be decomposed into carbonic acid and alcohol, and the gas will collect in the upper part of the tube. Or the carbonic acid may be conducted off by a fine tube into lime-water, which becomes turbid from the formation of insoluble carbonate of lime.

BILE.—Urine containing bile has a peculiar greenish-black color.

The tests are the following:—

1. *Noel's Test.*—Immerse a strip of blotting paper for a few minutes in the fluid, dry, and add a drop of nitric acid containing a little nitrous acid. If bile be present, a violet color results, changing to red or yellow.

2. *Pettenkofer's Test for Bile Acids.*—Add to the liquid, in a test-tube, a little powdered white sugar, or its equivalent of syrup. Then pour in of strong sulphuric acid (very gradually) rather more than half the bulk of the liquid. The temperature is thus gradually raised to the proper point, and a deep purplish-crimson color appears. This test frequently fails in the examination of the urine.

3. *Nitric Acid Test.*—Place a drop of the fluid on a white porcelain plate, add carefully a drop or two of strong nitric acid, and at the point of contact of the fluid with the acid there will be a play of colors, passing from red to green, pink, blue, violet, and yellow. The green

tinge, though often evanescent, indicates the presence of bile.

4. *Oxide of Silver Test.*—Boil the fluid with an ammoniacal solution of silver oxide. Acidulate the filtrate with a few drops of hydrochloric acid. If biliverdin be present, a purple color will be produced, owing to the formation of an artificial compound, bilipurpin.

5. *Maréchal's Test.*—This is employed as follows: Place about ℥j of the urine in a test-tube, and allow one or two drops of tincture of iodine to trickle down the side of the tube, held nearly horizontally, so that the two fluids may touch, but not mix. If bile pigment be present, a fine green color will almost immediately be developed below the red iodine layer. By holding the test-tube up against a white cloud, or a white surface, in a good light, the three zones of color will be distinctly visible.[1]

Lactic Acid.—This acid is rarely present in the urine, but may be detected by evaporating fresh urine nearly to dryness, and treating the residue with a solution of oxalic acid in alcohol. Oxalates are precipitated; lactic acid remains in solution, which is digested with litharge, evaporated to dryness, and an alcoholic solution of lactate of lead obtained, which is decomposed by sulphuretted hydrogen, the sulphide of lead filtered off, and the fluid evaporated to a syrup. The syrup is then shaken up with ether, the ethereal solution evaporated, and the lactic acid dissolved in water. The aqueous solution is then boiled with zinc oxide, and the crystals of lactate of zinc are allowed to separate.

Of the other abnormal constituents, FAT, in the form of oil globules, usually associated with fatty casts, may indicate an advanced condition of Bright's disease.—

[1] Dr. W. G. Smith, *Dub. Journ. Med. Science*, Dec. 1876, in *Amer. Journ. Med. Sciences*, April, 1877, 531.

CHYLE gives a white appearance to the urine, from the abundance of fatty molecules it contains; albumen is sometimes present when it coagulates on cooling. Possibly there may be abnormal communication between the lacteal system and the ureters or kidneys.—KIESTEIN, a granular albuminous matter, occurs in the urine of pregnant women, forming with crystals of triple phosphate and fat globules a fat-like scum on the surface.—ACETIC and BUTYRIC ACIDS are found only in decomposing urine, and are not important.—SULPHURETTED HYDROGEN is rarely found in urine, but may be detected by blackening a piece of paper dipped in a solution of acetate of lead and held over it.—ALLANTOIN is only a temporary and occasional constituent, in young children especially.—LEUCIN occurs in hepatic cases, and is detected by microscopic examination. It is usually seen in roundish yellowish-colored balls, made up of masses of small needle-like crystals.—TYROSIN occurs under similar conditions, and is similarly detected, consisting of stellate groups of long silky needles, not in balls or colored, as with leucin.

Examination of the Sediments of Urine.

Urinary deposits may be divided into three classes: 1. Those which occur in acid or alkaline urine, namely, uric acid, urates, phosphates, oxalates, and cystin. 2. In alkaline urine only, namely, the ammoniaco-magnesian, or triple phosphate, phosphate of lime, and urate of ammonia. 3. Organized deposits, namely, mucus, blood, pus, tube casts, spermatozoids, torulæ, sarcinæ, bacteria, vibriones, etc.

I. *Deposits found occasionally in Acid or Alkaline Urine, usually in the former.*

URIC ACID.—Yellow, reddish, or brown sediment; little masses of crystals, assuming various forms, as lozenge-

shaped rhombs, rectangular tables or prisms, dumb-bell and spindle or barrel-shaped crystals.

Urates.—These appear when the urine is cold, if the salts are present in excess, the urates being much more soluble in hot water than in cold. Consequently every deposit which disappears on heating consists of urates. They usually form a heavy precipitate at the bottom of the glass, with an ill-defined upper border; and are white or deeply tinted by the coloring matter of the urine. They have been termed "lateritious deposit," "brick-dust deposit," "critical deposit," and "purpurates."

Urate of soda is amorphous in urine, but prepared artificially by acting with uric acid on sodium phosphate, it forms acicular crystals.

Urate of ammonia appears as an amorphous granular sediment, or in the form of brown round balls covered with spines.

Urate of lime is a white amorphous powder, of rare occurrence.

PHOSPHATES.—In acid urine they appear as a cloudy precipitate, at once soluble in a drop of nitric or hydrochloric acids.

OXALATE OF LIME may be detected by its characteristic octahedral or dumb-bell crystals. It is not a distinct sediment, but exists as isolated crystals entangled in the mucous cloud with which it is usually associated.

CYSTIN.—This occasionally exists as a sediment mixed with amorphous urates. Under the microscope it is seen in transparent, colorless, six-sided plates. If it occurs in large quantity along with urates or phosphates, or both, it may be distinguished from them by heating and adding acetic acid; the heating dissolving the urates, and the acid the phosphates, but neither have any effect on the cystin.

II. *Deposits found occasionally in Alkaline Urine only.*

When, from any cause urine becomes alkaline, from the decomposition of urea into carbonate of ammonia, the earthy phosphates (of lime and magnesia), which are soluble only in a slightly acid fluid, are at once thrown down; the phosphate of lime remains unchanged, but the ammonia unites with the phosphate of magnesia and forms a precipitate of ammoniaco-phosphate of magnesia, or triple phosphate.[1]

The deposits of this class are all dissolved on adding a few drops of nitric or hydrochloric acid.

Ammoniaco magnesian, or Triple Phosphate.—It usually occurs in six-sided crystals, some elongated, others nearly square, some with sharp angles, others with broad facets. In very alkaline urine, they appear as feathery crystals.

Phosphate of Lime.—Usually an amorphous white powder; occasionally, aggregated into rosette-like crystals.

Urate of Ammonia and Urate of Lime, already referred to, may also be present; the former always in alkaline, rarely in acid urine; the latter occasionally in alkaline urine.

III. *Organized Deposits.*

Mucus.—The cloudy transparent flocculi seen in urine, when left at rest, consist of mucus entangling various forms of epithelial cells, derived from the urinary passages. The supernatant liquid being carefully poured off, and acetic acid added to the mucus, it coagulates, forming delicate molecular fibres.

[1] Neubauer and Vogel. Guide to Qualitative and Quantitative Analysis of the Urine. (New Sydenham Society's Publications.) 4th ed., p. 56.

Blood.—Urine containing blood has a peculiar smoky color, and always contains a trace of albumen. Under the microscope, the blood-corpuscles are usually colorless, have lost their biconcave form, and are globular from imbibition of water.

Pus.—If there be a thickish yellow deposit at the bottom of the vessel, of a stringy consistence, it usually consists of mucus containing pus. The supernatant fluid being poured off, an equal bulk of caustic potash is added to the deposit, which at once gelatinizes, becoming so thick and tough that it cannot be poured from the test-tube. When pus is present in small quantity, pus-corpuscles can readily be detected by the microscope.

Tube Casts.—These are either: 1. Fibrinous casts, often containing blood-disks. 2. Desquamative casts, containing epithelial casts. 3. Granular or fatty casts, containing numerous oil-globules, free, or in the epithelial cells. 4. Hyaline or waxy casts, solid and transparent, or containing epithelial cells, granules, and free nuclei. These bodies may be detected by allowing any sediment to fall to the bottom of a conical glass, removing a small portion of it with a fine pipette, placing a drop on a slide, covering it with a thin glass, and examining it with a power of 250 diam. linear.

Spermatozoids, Torulæ, Sarcinæ, Bacteria, Vibriones, etc., occasionally found in urine, may be readily detected by their characteristic microscopical appearance.

SUGGESTIONS FOR THE TREATMENT OF POISONING.

A condensed table of poisons, presenting, at a glance, the prominent symptoms and the most available remedies or antidotes, is sure to prove, sooner or later, of practical and immediate utility. After all, the general principles of treatment only can be indicated in such an outline portrait of the effects of toxical agents; the details must be left to the intelligence, aptness, and presence of mind of the practitioner. Whenever it may be possible to apply a direct chemical antidote, no time should be lost in its speedy employment. Of late years the antagonizing physiological action of various powerful remedies has also been invoked in cases of poisoning, and in a number of medical journals favorable results have been reported, where reliance had been successfully placed in this class of physiological opposites. Thus atropia, which dilates the pupil, has in a toxical overdose been combated by morphia, which contracts it; and a small dose of atropia administered hypodermically, say $\frac{1}{50}$ to $\frac{1}{30}$ of a grain, until it's characteristic effects are induced, is a physiological antidote to physostigmia, the active principle of Calabar bean. Watchful care must be taken, however, so far as quantity is concerned, lest in substituting one intensely potent agent for another the character of the poison may alone be changed, and the patient be left in equal peril. In cases in which no such chemical or physiological antidotal power is available, general principles of treatment must guide the practitioner in the employment of emetics, counter-irritants, etc.

The following classification, modified from that of

Taylor,[1] is based on the modus operandi of poisons on the human system in its normal or healthy state:—

Classification of Poisons.

CASE I. Irritants.	*Order* 1. Irritants proper.	Mineral	Non-metallic.
			Metallic.
	Order 2. Irritants producing remote specific effects.	Vegetable.	
		Animal.	
CLASS II. Neurotics.	*Order* 1. Cerebral.	Narcotics.[2]	
		Anæsthetics.[3]	
	Order 2. Spinal, or Tetanics.[4]		
	Order 3. Cerebro-spinal.	Deliriants.[5]	
		Depressants.[6]	
		Asthenics.[7]	

By way of illustration, the following explanation may be made:—

Irritants exert their action on the mucous membrane of the alimentary canal. They cause great pain in the abdomen, acrid and burning taste on swallowing, nausea, vomiting, purging, cramps, and sometimes bloody evacuations. Some irritants are corrosive, and act immediately. Death may ensue from collapse, from convulsions, from intense inflammation, or stricture of the œsophagus. The symptoms of irritant poisoning are not unlike those attendant on some of the diseases of the gastro-intestinal apparatus, as colic, gastritis, enteritis, cholera, etc.

Neurotics act specially on the cerebro-spinal system, producing drowsiness, headache, giddiness, coma, delirium, and occasionally convulsions, and at times an irritant action on the alimentary canal. The subdivision into *spinal*, *cerebral*, and *cerebro-spinal neurotics* indicates

[1] Manual of Toxicology, by Dr. John J. Reese; Phila., 1874.

[2] As opium and alcohol. [3] As ether, chloroform, and alcohol.

[4] As nux vomica, strychnia, brucia, etc.

[5] As belladonna, stramonium, hyoscyamus, solanum.

[6] As conium, tobacco, lobelia, aconite, Calabar bean.

[7] As hydrocyanic acid, oil of bitter almonds, digitalis, cocculus indicus, etc.

the mode of action of each. Self-evident also is the method of subdivision of the latter into *deliriants*, *depressants*, and *asthenics*, the latter producing death by shock. The symptoms may resemble those of apoplexy, epilepsy, and uræmic poisoning, or insidious cerebro-spinal diseases, which at times burst unexpectedly and with full force on the patient.

The Treatment of Poisoning.

The treatment of poisoning is briefly and concisely detailed in the statement on page 293, prepared for the ready reference of the practitioner. The list of articles is arranged alphabetically for convenience, the class to which each belongs being mentioned. He should, in the absence of any information as to specific chemical or physiological antidote or remedy, treat the case on general principles; in other words, evacuate the stomach by emetics or the stomach pump; resort to the use of cathartics, if they seem to be indicated, stimulants, diluents, oleaginous substances, external friction, artificial respiration, etc., according to the urgency of the symptoms.

A General Antidote for Poisons has been suggested by Jeannel for use in poisoning by various powerful agents, as arsenic, zinc, digitaline, etc., the preparations of which are rendered completely insoluble by it:—

Solution of sulphate of iron (sp. gr. 1.45), 2½ oz.
Water, 20 oz.
Calcined magnesia, 2 oz.
Washed animal charcoal, 1 oz.

The ingredients are kept separate, the solution of the sulphate in one vessel, the magnesia and charcoal in another, with some water. When needed for use, the solution of the sulphate is poured into the other vessel, and violently agitated. The mixture should be administered in doses of from one and a half ounces to three ounces.

The person who should happen to be nearest at hand in any case of poisoning, and especially if there be any likelihood of the case being the subject of a coroner's or magistrate's inquiry, must be sure and at once to note the position and surroundings of the patient, as well as at the same time noticing whether any bottles likely to have contained the poison are in the room, or near at hand.[1] Then proceed immediately to *get the poison out of the stomach as soon as possible;* and this must be done by encouraging vomiting. Vomiting is, as a rule, one of the first and most important signs of poisoning, and such being the case, it is often only necessary to foster this tendency by copious and large draughts of warm water. If, however, vomiting be not present, then we must at once administer an emetic. The best medicinal emetic is undoubtedly sulphate of zinc, in twenty- to thirty-grain doses, but, in all probability, you will not have this at hand. Ipecacuanha wine is, as a rule, a medicine you will find in most houses, and two tablespoonfuls of this, with warm water, is often quickly efficacious. If we have not this, however, we must resort to mustard and water, which proves an excellent substitute; a teaspoonful or two being given in warm water, and frequently repeated. Common salt and water may be used with good effect; and vomiting may also be excited by tickling the back of the throat, as well as by the free use of hot greasy water.

In the absence of a stomach pump, an excellent substitute for the stomach pump can be made, and easily and safely used, if the patient is at all conscious, by means of a piece of elastic gutta-percha tubing, about three yards in length and half an inch in diameter. Make the patient swallow about from twenty to twenty-five inches of this, and you will find this much more easily accomplished than you would think. You then hold the free end of the tube above

[1] From "Ambulance Lectures," by L. A. Weatherly, M.D., London.

the patient's head and pour down, through a funnel, a pint or two of warm water, which, of course, goes direct into the stomach. By lowering now the free end, the stomach empties itself readily; and this being frequently repeated, the cavity of the stomach is completely washed out.

The *narcotic poisons*, such as *opium* and *morphia*, require, besides this immediate treatment, something more. You will find in these cases a great and overwhelming tendency to *sleepiness* and *drowsiness*, and this must be guarded against. Once allow a person poisoned by opium to become insensible, and the chance of recovery will be much diminished. You must not relax for one moment in your efforts; walk him briskly about. If he cannot walk, drag him about; throw cold water in his face; irritate his legs and feet by striking them with a wet towel; administer strong coffee, and, in fact, do all in your power, however cruel it may seem at the time, to keep your patient awake. If, however, these all fail, and the unconscious state comes on, then you must have recourse to artificial respiration, as it is applied in "Restoration of the Apparently Drowned." (See chapter on that subject.)

In cases of *irritant poisoning* you will generally find a disposition to vomiting, but this should not be encouraged by emetics. Acids and alkalies form antidotes to each other, and the acids best suited for this purpose, and usually at hand, are vinegar, orange juice, and lime or lemon juice, of course, mixed with water; while the alkalies are soda, potash, magnesia, or lime, also mixed with water. Demulcent drinks, such as milk or barley water, should be given, and white of egg, salad oil, and castor oil, may be used with great advantage in these cases, so as to protect the œsophagus and walls of the stomach from further damage.

Poison.	Class.	Treatment.
Acetic acid.	Irritant.	Free vomiting, followed by exhibition of alkaline carbonates, chalk, or magnesia.
Aconite (and Aconitia).	Cerebro-spinal neurotic.	Active emetics or stomach-pump. Stimulation externally and internally. Finely-powdered animal charcoal, or tannin and astringent infusions. Digitalis considered a physiological antidote.
Alcohol.	Cerebral neurotic.	Stomach-pump; cold affusion; inhalation of vapor of ammonia; use of electro-magnetic apparatus.
Aloes.	Irritant.	General treatment for irritant poisons.
Aluminium and potassium, sulphate of.	Irritant.	See Potassa.
Ammonia, salts of.	Irritant.	Mild vegetable acids, as dilute vinegar or lemon-juice; olive oil; milk may be given copiously; stomach-pump should not be used.
Ammonia, vapor of.	Irritant.	Inhalation of vapor of acetic acid.
Amylene.	Cerebral neurotic.	Same treatment as for chloroform poisoning.
Antimony and its preparations.	Irritant.	Free vomiting with warm mucilaginous drinks, or stomach-pump. The proper antidote is tannin, as in tincture or infusion of cinchona, infusion of green tea, or of galls. Opium, and internal and external stimulation, may be employed subsequently.
Arsenic, preparations of.	Irritant.	See Arsenious acid.
Arsenious acid.	Irritant.	In the absence of vomiting prompt emesis by sulphate of zinc or warm mustard and water. Warm demulcent drinks. Antidote: Hydrated sesquioxide of iron, in a moist state, in tablespoonful doses, followed by castor oil. (The hydrate may be extemporaneously prepared by adding aqua ammoniæ to dilute tinctura ferri chloridi.) Freshly-precipitated hydrate of magnesia has also been employed. Antidote not reliable if the arsenic has been taken in form of powder.
Atropia.	Cerebro-spinal neurotic.	See Belladonna.
Barium, salts of.	Irritant.	Sulphate of soda or of magnesia; emetics or stomach-pump.
Belladonna (and Atropia).	Cerebro-spinal neurotic.	Prompt emetic or stomach-pump. No reliable chemical antidote: tannin and animal charcoal have been employed. Physiological antidote, morphia, which may be administered subcutaneously. Jaborandi has also been suggested.

Poison.	Class.	Treatment.
Bismuth, subnitrate of.	Irritant.	Albumen, milk, sugar, mucilaginous drinks.
Bromine.	Irritant.	General treatment for irritant poisons.
Brucia.	Spinal neurotic.	Same treatment as for poisoning by nux vomica.
Calabar bean (and Physostigmia).	Cerebro-spinal neurotic.	Free emesis. Physiological antidote, atropia, cautiously administered hypodermically.
Camphor.	Irritant.	Emetics, stimulants, wine, opium.
Cantharides.	Irritant.	Free emesis to be encouraged with warm demulcent drinks; castor oil; demulcent injections.
Carbolic acid.	Irritant.	Early use of the stomach-pump. Olive oil; saturated solution of saccharate of lime has been recommended as an antidote.
Chloral.	Cerebral neurotic.	Stomach-pump; stomach well washed out with tea or coffee. General treatment same as for opium poisoning, or poisoning by chloroform vapor.
Chloroform.	Cerebral neurotic.	In poisoning by liquid chloroform, stomach-pump and emetics. General treatment of poisoning by the vapor same as that hereafter mentioned for ether. Reverse the patient, as recommended by Nélaton.
Chromium, compounds of.	Irritant.	Emetics; carbonates of magnesia or chalk in milk, albumen, or water.
Citric acid.	Irritant.	Free vomiting, followed by exhibition of alkaline carbonates, chalk, or magnesia.
Cocculus Indicus.	Cerebro-spinal neurotic.	Emetics, mucilaginous drinks, stimulants.
Colchicum.	Irritant.	Prompt emesis, castor oil, demulcents, opium, and stimulants.
Conium (and Conia).	Cerebro-spinal neurotic.	Prompt emesis by mustard and water. Active stimulation, externally and internally.
Copper, preparations of.	Irritant.	Free vomiting should be aided by warm mucilaginous drinks, stomach-pump if necessary. Antidote, white of eggs, freely administered, forming insoluble albuminate; or milk, forming insoluble caseate of copper.
Corrosive sublimate.	Irritant.	Free vomiting aided by warm, diluent drinks; stomach-pump may produce perforation. Antidote, white of eggs, mixed with water and given copiously, forming insoluble compound; white of one egg neutralizes four grains of corrosive sublimate. Gluten, or wheat flour paste, or milk, also employed.

Poison.	Class.	Treatment.
Creasote.	Irritant.	Emetics or stomach-pump; demulcent and mucilaginous drinks.
Croton oil.	Irritant.	Same general treatment as for other irritant poisons, to counteract excessive vomiting and purging. Opium, stimulants, etc.
Curara.	Spinal neurotic.	Same general treatment as that mentioned for poisoning by nux vomica.
Daturia.	Cerebro-spinal neurotic.	See Stramonium.
Digitalis (and Digitaline).	Cerebro-spinal neurotic.	Free use of emetics; vegetable infusions containing tannic acid render the active principle insoluble.
Elaterium.	Irritant.	General treatment for irritant poisons.
Ether, vapor of.	Cerebral neurotic.	Withdraw the cause; cold affusion; exposure to current of air; artificial respiration.
Gelsemium.	Irritant.	General treatment for irritant poisons.
Gold, preparations of.	Irritant.	Sulphate of iron; mucilaginous drinks.
Hydrochloric acid.	Irritant.	See Muriatic acid.
Hydrocyanic acid.	Cerebro-spinal neurotic.	Being rapidly fatal, treatment must be instantaneous. Cold affusion; cautious inhalation of ammonia and chlorine vapors; stimulation externally and internally. Mixture of protosulphate and sesquisulphate of iron, followed by solution of carbonate of potassium, to produce insoluble Prussian blue, has been proposed as a chemical antidote.
Hyoscyamus (and Hyoscyamia).	Cerebro-spinal neurotic.	Same general treatment as for poisoning by belladonna.
Iodine.	Irritant.	Starch or flour in water.
Iron, chloride and sulphate of.	Irritant.	Magnesia, copious diluent drinks.
Lead, acetate, subacetate, and carbonate of.	Irritant.	Sulphate of zinc, producing free emesis, and forming insoluble sulphate of lead. Milk and white of egg, given copiously, form insoluble compounds. Solutions of sulphate of magnesia or of soda, freely administered, act as antidotes and cathartics; or castor oil.
Lobelia.	Cerebro-spinal neurotic.	Emetics, purgatives, stimulants.
Mercury and its preparations.	Irritant.	See Corrosive sublimate.
Methylene, bichloride of.	Cerebral neurotic.	Same treatment as for poisoning by chloroform vapor.

Poison.	Class.	Treatment.
Morphia.	Cerebral neurotic.	See Opium.
Muriatic or hydrochloric acid.	Irritant.	Solution of alkaline carbonates in water or milk; magnesia or chalk suspended in milk; soapsuds; scrapings from whitewashed walls (in the absence of other articles), oily emulsions, gruel, and milk in large quantities; free use of barley water.
Nicotia.	Cerebro-spinal neurotic.	See Tobacco.
Nitrous oxide.	Cerebral neurotic.	Same general treatment as for poisoning by chloroform vapor.
Nitric acid and Nitro-muriatic acid.	Irritant.	Same treatment as already detailed for poisoning by muriatic acid. Dilute solution of carbonate of sodium, or fluid magnesia, with water, and demulcents may be given.
Nux vomica.	Spinal neurotic.	See Strychnia.
Oil of bitter almonds.	Cerebro-spinal neurotic.	Same treatment as for hydrocyanic acid poisoning.
Opium, and its preparations.	Cerebral neurotic.	Direct emetics, as large doses of sulphate of zinc, repeated if necessary, or mustard and warm water, or stomach-pump. Persevere until no smell of opium remains. For the narcotic effect of the drug, affusion with cold water, walking the patient, arousing him by shaking and shouting; flagellations; afterwards strong coffee. If unsuccessful, electro-magnetism, applied between upper part of spine and chest. Artificial respiration as a last resort. As antidotes, tannic acid and iodated iodide of potassium, not reliable if employed alone. Physiological antidote, solution of atropia or tincture of belladonna.
Oxalic acid.	Irritant.	Avoid the use of alkalies or their carbonates, as they will form poisonous salts with the oxalic acid. Give chalk or magnesia, or its carbonate, suspended in water or milk, forming insoluble and inert earthy oxalates; or saccharated solution of lime. After-treatment, mucilaginous drinks, lime-water, and oil; warmth and stimulants.
Phosphorus.	Irritant.	Free vomiting, with sulphate of copper, especially; albuminous and mucilaginous drinks, in which hydrate of magnesia is suspended. Oil, being a solvent of phosphorus, should be avoided. Old oil of turpentine (containing oxygen), oxygenated water, oxygen inhalations, animal charcoal, have been employed as antidotes. Intravenous injection of oxygen is also recommended. Avoid animal fat in diet.

Poison.	Class.	Treatment.
Physostigmia.	Cerebro-spinal neurotic.	See Calabar bean.
Potassa, and salts, generally, of potassium.	Irritant.	Mild vegetable acids, as dilute vinegar or lemon-juice; demulcent drinks; olive oil, in large quantities, produces a soap. Milk may be copiously administered. Stomach-pump should not be used.
Potassium, bitartrate of.	Irritant.	Same treatment as for the nitrate. Dilute solution of bicarbonate of potassium reduces bitartrate to harmless neutral tartrate.
Potassium, cyanide of.	Cerebro-spinal neurotic.	Weak solution of sulphate of iron converts it into Prussian blue. Treatment similar to that for hydrocyanic acid.
Potassium, iodide of.	Irritant.	General treatment for irritant poisons.
Potassium, nitrate of.	Irritant.	No known antidote; stomach-pump; free vomiting, and copious mucilaginous drinks; stimulants, opium, camphor, etc., if great depression exists.
Potassium and aluminium, sulphate of.	Irritant.	Warm dilute drinks to produce emesis; hydrate of magnesia, or weak solution of carbonate of ammonium; stomach-pump.
Prussic acid.	Cerebro-spinal neurotic.	See Hydrocyanic acid.
Savine.	Irritant.	General treatment for irritant poisons.
Silver, preparations of.	Irritant.	Albumen, milk. If nitrate of silver, the chloride of sodium.
Soda, and its preparations.	Irritant.	Same treatment as for poisoning by compounds of potassium.
Stramonium (and Daturia).	Cerebro-spinal neurotic.	Same treatment as for poisoning by belladonna. Morphia should be administered subcutaneously until contraction of the pupils results.
Strychnia.	Spinal neurotic.	Prompt emesis by stomach-pump, or mustard and warm water, or mixture of ipecacuanha and sulphate of zinc. Inhalation of chloroform continuously employed may relieve tetanic rigidity. Bromide of potassium, in very large doses, a physiological antidote. Hydrate of chloral, nitrite of amyl, atropia have also been employed.
Sulphuric acid.	Irritant.	Same treatment as for poisoning by muriatic acid. Solution of carbonate of sodium in milk and water.
Sulphate of indigo.	Irritant.	(Used in dyeing.) Relieved by calcined magnesia and milk, or fluid magnesia.
Tartaric acid.	Irritant.	Same treatment as for poisoning by citric acid or oxalic acid.

Poison.	Class.	Treatment.
Tartar emetic.	Irritant.	See Antimony.
Tin, preparations of.	Irritant.	General treatment for irritant poisons.
Tobacco (and Nicotia).	Cerebro-spinal neurotic.	Stomach-pump or emetics ; injections *per anum.*
Veratrum (and Veratria).	Irritant.	Rapid emesis, stimulants, with laudanum or some other opiate. Tannin has been proposed as an antidote.
Zinc, chloride of.	Irritant.	Free emesis, copious warm mucilaginous drinks, or stomach-pump, albumen given liberally. Opium, if necessary.
Zinc, sulphate of.	Irritant.	Tepid water with milk and albumen ; infusions containing tannic acid. Stomach-pump. Emollient enemata.

There is a number of so-called *vegetable irritants*, such as aloes, scammony, jalap, etc., which may give rise to toxical symptoms. Their effects should be treated on general principles, such as the employment of emetics, diluents, castor oil, opium, fomentations, etc. The same remarks apply also to the various articles of diet, such as fish, meat, etc., which occasionally produce similar effects. *Irritant gases*, as chlorine, nitrous acid or sulphurous acid vapor, etc., may act as poisons, and their effects should be treated by removal of the patient from the causes, cold affusion, etc. The numerous poisonous *fungi*, which may be taken into the stomach, may also produce symptoms, which may require treatment on the previously-mentioned general principles.

Bites of venomous reptiles require a special treatment. Reference will elsewhere be made to their treatment and to that of *bites of rabid animals.*

READY REFERENCE TABLE OF ANTIDOTES.[1]

General Remarks.—An emetic is unnecessary when the poisoned patient has already vomited freely.

Antidotes for

Unless otherwise stated, the figures denote grammes.

1. *Aconitia.*

℞.	Cupri sulph.	1.0
	Aquæ dest.	40.0

Dissolve.

S.—Emetic; give half, and balance, if necessary, in five minutes. Then:

℞.	Acid. tann.	4.0
	Aquæ dest.	200.0
	Syr. simpl.	50.0

M. S.—Tablespoonful every five minutes.

2. *Alcohol Intoxication.*

℞.	Pepsini	2.0
	Aquæ dest.	200.0
	Acid. mur.	1.00

M. D. S.—Teaspoonful every five minutes. Or

℞.	Aquæ ammon.	gtt. 10
	Aquæ dest.	150.0
	Syr. simpl.	20.0

M. S.—Take at once.

3. *Alkali Carbonates and Caustic Alkalies.*

℞.	Acidi tartaric.	10.0
	Aquæ font.	1000.0

M. S.—Drink a tumblerful at once; then every five minutes a dessertspoonful of almond oil, with five tablespoonfuls of the tartaric acid solution. (This is sufficient for 100 grams of a 5 per cent. solution of alkali.)

4. *Ammonia.*

℞.	Acid. acet. concent.	10.0

S.—For smelling.

℞.	Acet. crud.	20.0
	Aquæ dest.	200.0
	Syr. simp.	20.0

M. S.—Tablespoonful every five minutes.

℞.	Aceti crudi	50.0
	Aquæ dest.	200.0

S.—Inhale warm. (Cold washing)

5. *Anilin Preparation.*

℞.	Cupri sulph.	1.0
	Aquæ dest.	40.0

S.—Emetic; half to be taken at once, and the other half in five minutes, if necessary.

℞.	Magn. ust. in aq.[2]	200.0

D. S.—Tablespoonful every half hour.

6. *Antimonial Preparations and Tartar Emetic.*

℞.	Acid. tannic.	3.0
	Aquæ dest.	140.0
	Syr. althææ	60.0

M. S.—Tablespoonful every five minutes.

[1] By Dr. Th. Schlosser. Translated from "Ztschr. d. Allg. Oest. Apoth. Ver.," 1880, Nos. 1 and 2, by Louis von Cotzhausen, Ph.G., in "Amer. Journ. of Pharmacy," March, 1880.

[2] ℞. Magnesiæ . . . . . ℥j.
Aquæ . . . . . . Ovj.

7. *Arsenic Preparations.*

℞. Magn. ust. in aq.[1] . . 200.0

D. S.—One-third to be taken at once, then a tablespoonful every five minutes.

8. *Atropia.*

℞. Fol. jaborandi . . . 10.0

Fiat infus. ad colat. . . 200.0

S.—Take half at once, then every half hour a tablespoonful with a tablespoonful of wine.

℞. Pilocarpin. mur. . . 0.05

Aquæ dest. . . . 2.00

S.—Inject hypodermically.

9. *Baryta.*

Treat like lead salts.

10. *Belladonna.*

Treat like atropia.

11. *Bites by Dogs and Cats.*

℞. Potassæ 1.0

Aquæ dest. . . . 500.0

M. S.—Wash the wound, and keep open with linen dipped into it, until a physician arrives.

12. *Bite of Snakes.*

See bites by dogs.

℞. Aquæ ammon. . . . gtt. 30

Aquæ dest. . . . 150.0

Syr. simp. . . . 30.0

M. S.—Tablespoonful every five minutes.

13. *Bromine.*

℞. Magn. ust. in aqua[1] . . 200.0

S.—Take one-third at once, then a tablespoonful every quarter of an hour.

14. *Brucia.*

Treat like strychnia.

[1] See foot-note, p. 290.

15. *Cannabis Indica.*

Treat like morphia.

16. *Cantharidin.*

℞. Cupri sulph. . . . 1.0

Aquæ dest. . . . 40.0

M. S.—Emetic; take one-half immediately, and the balance in five minutes, if necessary. Then:

℞. Camph. 3.0

Muc. g. arabic . . . q. s.

Mixt. gummos. . . . 300.0

Tr. opii . . . . gtt. 10

M. S.—Tablespoonful every five to ten minutes.

17. *Carbolic Acid.*

Use the same emetic as for anilin.

Then:

℞. Magn. ust. in aqua[2] . . 200.0

S.—Take one-half at once, then every quarter of an hour a tablespoonful alternately with

Mixt. oleos. . . . 200.0

S.—Tablespoonful every quarter of an hour.

18. *Carbonic Oxide and Carbonic Acid Gas.*

℞. Aquæ ammon. . . . 40.0

S.—For smelling. (Cold ablutions.)

℞. Extr. ergotæ . . . 0.30

Aquæ dest. . . . 50.0

S.—Dessertspoonful every quarter of an hour.

19. *Caustic Alkalies.*

See alkali carbonates.

20. *Caustic Lime and Calcium Salts.*

℞. Magnes. sulph. . . . 20.0

Aquæ dest. . . . 100.0

Syr. simpl. . . . 40.0

Dissolve. S. Take at once.

Then:

℞. Ol. amygd. dulc. . . 20.0
Pulv. gum. acaciæ . . 10.0
Aquæ dest. . . . 15.0
Syr. simpl. . . . 100.0

M. D. S.—Two dessertspoonfuls every quarter hour.

21. *Chloral Hydrate.*

℞. Atrop. sulph. . . milligram. 2
quæ dest. . . . 35.0

M. S.—Give in two doses, in the course of half an hour. (Instead of atropia, tincture of belladonna 2.0 may be iven in the same manner).

22. *Chlorine Vapors.*

℞. Aquæ laurocerasi . . 10.0
Ætheris,
Alcohol, 90 per cent. āā 30.0

S.—For smelling and inhaling.

℞. Spir. nitr. dulc. . . . 20.0
Syr. althææ,
Aquæ dest. . . āā 40.0

M. S.—A tablespoonful every five or ten minutes.

23. *Chloroform.*

℞. Aquæ ammon. . . . 50.0

S.—For smelling. (Cold douche and ice applied to the head.)

℞. Two Seidlitz powders.

S.—Give one.

If very bad, give

℞. Cupr. sulph. . . . 1.0
Aquæ dest. . . . 40.0

S.—Emetic; give one-half, and, if necessary, the other half five minutes later.

24. *Chromic Acid and Chromates.*

℞. Pulv. ferri . . . 5.0
Linct. oleos.,[1]
Syr. simp. . . . āā 50.0

M. S.—Shake well, and take a dessertspoonful every five minutes, and then two tablespoonfuls of water.

25. *Codeia.*

See morphia.

26. *Colchicia.*

See aconitia.

27. *Conia.*

℞. Strych. nitrat. . . . 0.01
Aquæ dest. . . . 100.0
Tr opii . . . . gtt. 30

M. S.—Two dessertspoonfuls every quarter of an hour, until one-third is taken; then every half hour, until the second one-third is consumed; then every hour.

28. *Copper Money Swallowed.*

To children:

℞. Hydrom. infant.[2] . . 20.0

D. S.—Give at once.

To adults:

℞. Aq. laxat. Vienn.[3] . . 50.0
Sodii sulph. cryst. . . 10.0

D. S.—Take at once.

[1] *Linctus Oleosus.*

℞. Acaciæ pulv. . . . . . . p. j.
Aquæ amygd. amar. dilut.
Ol. amygdal. express. . . āā p. ij.
Syrupi althææ . . . . . . p. iij.
M.

[2] *Hydromel Infantum* is composed of Vienna draught, 3 p.; Syrup of manna, 1 p.

[3] See footnote, p. 302.

29. *Copper Salts.*

℞. Pulv. ferri . . . 14 0
Flor. sulph. lot. . . 8.0
Syr. simpl. . . . 60.0

M. D. S.—Shake well, and give a dessertspoonful every five minutes, alternating with

℞. Magn. ust. in aq.[1] . . 200.0
Mix with white of 4 eggs and add
Aquæ dest. . . . 200.0
Syr. simpl. . . . 80.0

S.—Half a teacupful every five minutes.

30. *Creasote.*

℞. Pulv acaciæ . . . 10.0
Ol. amygd. dulc. . . 20.0
Aquæ dest. . . . 280.0
Ft. emulsio.

D. S.—Take one-fourth at once, then half a teacupful every ten minutes.

31. *Curare.*

℞. Strychn. nitr. . . 0.05
Aquæ dest. . . 5.0
M. S.—Inject.

32. *Cyanide of Potassium and Prussic Acid.*

℞. Cupri sulph. . . . 2.0
Aquæ dest. . . . 28.0
Dissolve.

S.—Emetic; tablespoonful at once, the balance in five minutes. (Cold water ought to be applied.)

33. *Digitalis.*

Like morphia.

34. *Ergot.*

Like sausage poison.

[1] See footnote, p. 299.

35. *Excessive Etherization.*

℞. Aquæ ammon. . . . gtt. 15
Aquæ dest. . . . 20.0
S.—To be taken at one dose.

℞. Aquæ ammoniæ . . 30.0
S.—For smelling. (Cold water must be freely applied and fresh air.)

36. *Fungi.*

Like morphia.

37. *Gratiola.*

Like aconitia.

38. *Helleborus.*

See aconitia.

39. *Hyoscyamus.*

See morphia.

40. *Iodini.*

℞. Amyl. 5.0
Mix by triturating with a little water; then pour on
Aquæ fervidæ . . . 100.0
and add
Magn. ust. in aqua[1] . . 100.0
S.—Tablespoonful every five minutes.

41. *Lactucarium.*

As morphia.

42. *Lead Salts.*

℞. Aquæ laxat.[2] . . . 50.0
Magnes. sulph. . . . 30.0
Aquæ ferv. . . . 100.0
M. S.—Give in two doses, within ten minutes.

43. *Lime.*

See caustic lime.

[1] See footnote, p. 299.

[2] *Aqua laxativa Viennensis* is nearly identical with infus. sennæ comp. Ph. Germ. Infuse senna 6 p. in hot water 48 p. for half an hour, strain, and add manna 8 p.

44. *Mercury Salts.*

See copper salts.

45. *Mineral Acids.*

℞. Magn. ust. in aq.[1] . 200.0

D. S.—Take one-half at once; then a tablespoonful every five minutes, alternating with two tablespoonfuls of the following:—

℞. Ol. amygd. dulc. . .	20.0
Pulv. acaciæ . . .	10.0
Aquæ dest. . . .	200.0
Syr. simp. . . .	100.0

Fiat emuls.

46. *Morphia.*

℞. Cupri sulph. . . .	1.0
Aquæ dest. . . .	40.0

M. D. S.—Emetic; give one-half, and, if necessary, the balance in five minutes.

Besides:

℞. Coffeæ tostæ . . .	50.0
F. infusum ad colatur. .	200.0
Acidi tannici . . .	4.0
Syr. simpl. . .	50.0

S.—Teaspoonful every five minutes.

47. *Muscarin.*

See chloral hydrate.

Or

℞. Atrop. sulph. . . .	0.01
Aquæ dest. . . .	5.0

S.—Use as an injection.

48. *Nicotina.*

In case of nausea in consequence of smoking.

℞. Aceti crudi . . .	50.0
Aquæ dest. . . .	200.0
Syr. simpl. . . .	50.0

M. S.—One-half at once, and then a tablespoonful every five minutes.

In case of poisoning.

See morphia.

℞. Acidi tannici . . .	4.0
Aquæ dest. . . .	200.0
Syr. simpl. . . .	50.0

M. D. S.—Tablespoonful every five minutes.

49. *Oxalic Acid and Oxalates.*

℞. Calcii carb. pulv. . .	50.0
Aquæ dest. . . .	200.0

M. D. S.—One-half at once; then every ten minutes a tablespoonful. Half an hour later take

℞. Aquæ laxat. Vienn.[1] . .	50.0
Sodii sulph. cryst.	10.0

Dissolve.

S.—Take at once.

50. *Opium.*

Treat like morphia.

51. *Paris quadrifolia.*

Like morphia.

52. *Petroleum, or Volatile Oils.*

℞. Mixt. oleos. . . . 1000.0

S.—Drink continually.

53. *Phosphorus.*

℞. Cupri sulph. . . .	1.0
Aquæ dest. . . .	40.0

Solve.

D. S.—Emetic; give one-half, and, if necessary, the balance in five minutes.

Then:

℞. Ol. terebinth. vetusti . 30.0
(the older the better), beat with the white of 2 eggs, and add

Aquæ menth. pip. . .	250.0
Syr. simpl. . . .	50.0

Fiat emulsio.

[1] See footnote, p. 299.

[1] See footnote, p. 302.

S.—Shake well, and give one tablespoonful every half hour, until one-fourth of the mixture has been given; then one tablespoonful every hour.

In doubtful cases of poisoning with phosphorus give

℞. Magn. ust. in aqua . . 20.0
Aquæ chlori . . . 120.0
M. D.

54. *Phosphorus Burns.*

℞. Argenti nitr. fus. . . 2.0
Aquæ dest. . . . 20.0
Solve.
S.—Apply with a camel-hair brush, and use as a wash.

55. *Prussic Acid.*

See cyanide of potassium.

56. *Pulsatilla.*

Treat like aconitia.

57. *Sabina.*

See morphia.

58. *Santonin.*

℞. Cupri sulph. . . . 1.0
Aquæ dest. . . . 40.0
S.—Emetic; give one-half at once, and, if necessary, the balance in five minutes.

59. *Sausage Poison, or Spoiled Meat.*

℞. Cupri sulph. . . . 1.0
Aquæ dest. . . . 40.0
S. D. S.—Emetic; give one-half at once, and, if necessary, the balance in five minutes.
Then give:
R. Ætheris pur. . . . 2.0
Aquæ dest. . . . 150.0
Tr. opii . . . . gtt. .10
Syr. capill. vener. . . 20.0
S.—Tablespoonful every half hour.

60. *Silver Preparations.*

℞. Sodii chlorid. . . . 20.0
Aquæ comm. . . . 300.0
M. D. S.—Give one-half at once, and then a tablespoonful every half hour.
Between the doses give:
℞. Mixturæ oleosæ,
Mixturæ gummosæ, . āā 150.0
M. S.—Two tablespoonfuls every half hour.

61. *Spoiled Meat.*

See sausage poison.

62. *Stings by Insects.*

R. Aquæ ammon. . . . 20.0
S.—Apply externally.

63. *Stramonium.*

Like opium.
Then:
℞. Morph. mur. . . . 0.10
Aquæ dest. . . . 10.0
Inject hypodermically.

64. *Strychnia.*

R. Acidi tannici . . . 3.0
Aquæ dest. . . . 140.0
Syr. althææ . . . 60.0
M. D. S.—Tablespoonful every five minutes.
℞. Chloral. hydrat. . . . 4.0
Aquæ dest. . . . 100.0
Solve.
S.—Tablespoonful every half hour.

65. *Sulphuretted Hydrogen.*

℞. Spir. ætheris comp. . . 30.0
S.—Give ten drops every five minutes in a dessertspoonful of water.

℞. Spir. æth. nitrosi . . 50.0
S.—Pour on a cloth, and apply to nostrils.

℞. Calc. hypochlor. . . . 40.0
S.—For smelling. (Fresh air; wash with vinegar.)

66. *Tartar Emetic.*

See antimonial preparations.

67. *Tin Salts.*

℞.	Pulv. ipecac.	2.0
	Aquæ dest.	100.0
	Syr. simpl.	20.0

M. D. S.—Emetic; to be taken in two doses inside of quarter of an hour.
Then:

℞. Magn. ust. in aqua[1] . . . 200.0
S.—Take one-third at once, then a tablespoonful every five minutes, besides plenty of milk.

68. *Veratria.*

Treat like morphia.

69. *Volatile Oils.*

See petroleum.

70. *Zinc Salts.*

℞.	Acidi tannici	4.0
	Aquæ dest.	140.0
	Syr. althææ	60 0

D. S.—Tablespoonful every five minutes.

[1] See footnote, p. 299.

DIRECTIONS FOR RESTORING THE APPARENTLY DROWNED.[1]

The leading principles of the following directions for the restoration of the apparently dead from drowning are founded on those of the late Dr. Marshall Hall, combined with those of Dr. H. R. Silvester, and are the result of extensive inquiries which were made by the Royal National Life-Boat Institution of England, amongst medical men, medical bodies, and coroners throughout the kingdom. These directions have been extensively circulated by the Institution throughout the United Kingdom and in the Colonies. They are also in use in the British navy, in the Coastguard service, and at all the stations of the British army, both at home and abroad.

The actual condition in drowning is due to the same cause as in death by hanging—the non-entrance of air into the lungs. If repeated attempts at breathing be made while the patient is in the water, air will escape from the chest, and water may pass into the air-passages, but this intrusion of water is no necessary condition of drowning. Hence no attempts need be made, as our forefathers taught, to remove the water from the chest, by rolling the body face downwards on a barrel, etc.

The points to be aimed at are—first and *immediately* the RESTORATION OF BREATHING; and, secondly, after breathing is restored, the PROMOTION OF WARMTH AND CIRCULATION.

The efforts to restore breathing must be commenced immediately and energetically, and persevered in for one

[1] Good Health, July, 1869.

or two hours, or until a medical man has pronounced that life is extinct. Efforts to promote warmth and circulation, beyond removing the wet clothes and drying the skin, must not be made until the first appearance of natural breathing; for if circulation of the blood be induced before breathing has recommenced, the restoration to life will be endangered.

Send immediately for medical assistance, blankets, and dry clothing, but proceed to treat the patient *instantly* on the spot, in the open air, with the face downward, whether on shore or afloat, exposing the face, neck, and chest to the wind, except in severe weather, and removing all tight clothing from the neck and chest, especially the braces.

Cautions.—Prevent unnecessary crowding of persons around the body, especially if in an apartment. Avoid rough usage, and do not allow the body to remain on the back unless the tongue is secured. Under no circumstances hold the body up by the feet. On no account place the body in a warm bath unless under medical direction, and even then it should only be employed as a momentary excitant.

To Restore Breathing.

Dr. Marshall Hall's Method.

To Clear the Throat.—Place the patient on the floor or ground with the face downwards, and one of the arms under the forehead, in which position all fluids will more readily escape by the mouth, and the tongue itself will fall forward, leaving the entrance into the windpipe free. Assist this operation by wiping and cleansing the mouth.

If satisfactory breathing commences, use the treatment described below to promote warmth. If there be only

slight breathing, or no breathing, or if the breathing fail, then—

To Excite Breathing.—Turn the patient well and instantly on the side, supporting the head, and excite the nostrils with snuff, hartshorn, and smelling salts, or tickle

Fig. 1.

DR. HALL'S METHOD. (INSPIRATION.)

the throat with a feather, etc., if they are at hand. Rub the chest and face warm, and dash cold water, or cold and hot water alternately on them. If there be no success, lose not a moment, but instantly—

To Imitate Breathing (see Figs. 1 and 2).—Replace the patient on the face, raising and supporting the chest well on a folded coat or other article of dress. Turn the body very gently on the side and a little beyond, and then briskly on the face, back again, repeating these measures

Fig. 2.

DR. HALL'S METHOD. (EXPIRATION.)

cautiously, efficiently, and perseveringly, about fifteen times in the minute, or once every four or five seconds, occasionally varying the side. On each occasion that the body is replaced on the face, make uniform but efficient

pressure with brisk movement, on the back between and below the shoulder blades or bones on each side, removing the pressure immediately before turning the body on the side.

By placing the patient on the chest, the weight of the body forces the air out; when turned on the side this pressure is removed, and air enters the chest. *The first measure increases the expiration—the second commences inspiration.* The result is respiration or natural breathing; and, if not too late, restoration to life.

During the whole of the operations let one person attend solely to the movements of the head and of the arm placed under it.

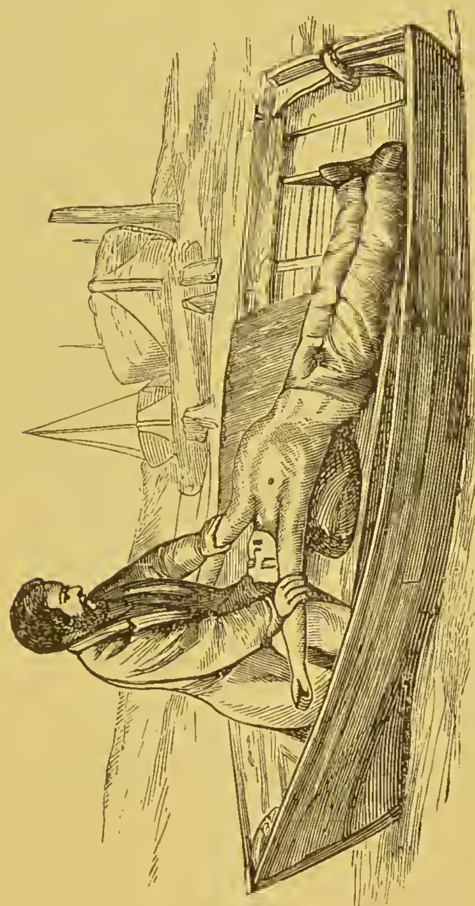
Whilst the above operations are being proceeded with, dry the hands and feet, and as soon as dry clothing or blankets can be procured, strip the body, and cover or gradually reclothe it, but taking care not to interfere with the efforts to restore breathing.

Dr. Silvester's Method.

Should the efforts just described not prove successful in the course of from two to five minutes, proceed to imitate breathing by Dr. Silvester's method, as follows: Place the patient on the back on a flat surface, inclined a little upwards from the feet; raise and support the head and shoulders on a small firm cushion or folded article of dress placed under the shoulder-blades. Cleanse the mouth and nostrils, draw forward the patient's tongue, and keep it projecting beyond the lips; an elastic band over the tongue and under the chin will answer this purpose, or a piece of string or tape may be tied around them, or by raising the lower jaw, the teeth may be made to retain the tongue in that position. Remove all tight clothing from about the neck and chest, especially the braces.

To Imitate the Movements of Breathing.—Standing at the patient's head, grasp the arms just above the elbows, and draw the arms gently and steadily upwards above the head, and keep them stretched upwards for two seeonds. *By this means air is drawn into the lungs.* Then turn down

Fig. 3.



Dr. SILVESTER'S METHOD. (INSPIRATION.)

the patient's arms, and press them gently and firmly for two seconds against the sides of the chest. *By this means air is pressed out of the lungs.* (See Figs. 3 and 4.) Repeat these measures alternately, deliberately, and perseveringly, about fifteen times in a minute, until a sponta-

neous effort to respire is perceived, immediately upon which cease to imitate the movements of breathing, and proceed to induce circulation and warmth.

Fig. 4.

DR. SILVESTER'S METHOD. (EXPIRATION.)

Treatment after Natural Breathing has been Restored.

To Promote Warmth and Circulation.

Wrap the patient in dry blankets; commence rubbing the limbs upwards, with firm grasping pressure and energy, using handkerchiefs, flannels, etc. *By this measure the blood is propelled along the veins towards the heart.* The

friction must be continued under the blanket or over the dry clothing. Promote the warmth of the body by the application of hot flannels, bottles, or bladders of hot water, heated bricks, etc., to the pit of the stomach, the armpits, between the thighs, and to the soles of the feet. If the patient has been carried to a house after respiration has been restored, be careful to let the air play freely about the room.

On the restoration of life, a teaspoonful of warm water should be given; and then, if the power of swallowing have returned, small quantities of wine, warm brandy and water, or coffee, should be administered. The patient should be kept in bed, and a disposition to sleep encouraged.

The above treatment should be persevered in for some hours, as it is an erroneous opinion that persons are irrecoverable because life does not soon make its appearance, persons having been restored after persevering for many hours.

The appearances which generally accompany death are entire cessation of breathing and of the heart's action; the eyelids are generally half closed; the pupils dilated; the jaws clenched; the fingers semi-contracted; the tongue approaches to the under edges of the lips, and these, as well as the nostrils, are covered with a frothy mucus; coldness and pallor of surface increase.

Dr. Howard's Method.

1. *Instantly* turn the patient downward, with a large, firm roll of clothing under his stomach and chest. Place one of his arms under his forehead, so as to keep his mouth off the ground. Press with all your weight, two or three times, for four or five seconds each time, upon the patient's back, so that the water is pressed out of his lungs and stomach, and drains freely out of his mouth. Then 2. *Quickly* turn the patient, face upward, with roll of clothing under his back, just below the shoulder blades, and make the head hang back as low as possible. Place the patient's hands above his head. Kneel with the patient's hips between your knees, and fix your elbows firmly against your hips. Now, grasping the lower part of the patient's naked chest, squeeze his two sides together, pressing *gradually* forward with all your weight, for about three seconds, until your mouth is nearly over the mouth of the patient; then, with a push, *suddenly* jerk yourself back. Rest about three seconds; then begin again, repeating these bellows-blowing movements with perfect regularity, so that foul air may be pressed out, and pure air be drawn into the lungs, about eight or ten times a minute, for at least an hour, or, until the patient breathes naturally.

Note.—The above directions must be used on the spot, the first instant the patient is taken from the water. A moment's delay, and success may be hopeless. Prevent crowding around the patient; plenty of fresh air is important. Be careful not to interrupt the first short natural breaths. If they be long apart, carefully continue between them the bellows-blowing movements, as before. After breathing is regular, let the patient be rubbed dry, wrapped in warm blankets, take hot spirits and water in small occasional doses, and then be left to rest and sleep.

DIRECTIONS FOR THE PREVENTION OF THE SPREAD OF DISEASES.

SUGGESTIONS FOR THE PRACTICAL APPLICATION OF DISINFECTANTS.

The employment of this class of agents has become so much more general in recent times, that it is deemed desirable and expedient here to embody some of the practical conclusions arrived at by scientific and other authorities on the subject. A knowledge of the means of prevention of the spread of malignant or infectious disease in communities is undoubtedly of greater importance than their cure in individual cases.

The Principles of Disinfection.[1]

Fresh air and pure water, constant ventilation, warm clothing, good food, and thorough cleansing, are natural means of preventing and destroying the causes of infection and disease. But there may be infected or foul places and things, and there are times of special necessity or sudden danger from the presence of infectious epidemic disease, which require the instant arrest or destruction of the infection and all its removable causes; this is disinfection. The clothing from persons with smallpox, scarlatina, or typhus, and even the air in the sick-rooms of such patients, is infectious; and the sick with typhoid fever or cholera *discharge excremental matters which possess infective properties that should be immediately destroyed.*

[1] The valuable recommendations contained in the following pages, many of which are almost inaccessible to the general practitioner through any other channel than that now offered, have been carefully collated from the admirable chapter on the subject in the Annual Report of the Board of Health of New York for 1873, and from other trustworthy sources, with numerous additions by the author.

In this memorandum the words infection and disinfection are employed just as they are understood, as referring to the preventable causes that are concerned in repropagating specific kinds of disease; these causes are:—

1. The specific infectious property or contagious substance of any one of the pestilential disorders.

2. The local impurities and moisture in the house and grounds where the outbreaks of disease have occurred or are liable to occur.

3. The foul exhalations and atmospheric impurities which injure health or help to propagate pestilential epidemics.

Experience has proved that it is possible, by certain chemical agencies (such as are or will be hereafter described), wholly to destroy or prevent the operation of the specific infection or *contagion* of any disease; but to do this, it is necessary that precise rules should be observed in applying the disinfectants; and, as regards cholera and typhoid fever, it is especially important that the infective discharges from the sick should be disinfected *as soon as voided from the body*, and that whatever clothing or surfaces may have been soiled by such discharges should be disinfected as soon as practicable. The fact should also be borne in mind by all persons who have charge of infected things, that the infective property or virus of some diseases, and of cholera especially, is capable of rapid increase in filthy places and in a foul, damp atmosphere. Therefore, the cleansing and disinfection of such places should, if possible, precede the arrival or outbreak of any such pestilence. Every unclean and damp place about dwelling houses, warehouses, factories, places of assemblage, passenger vessels, railway depots, and hotels, should be made and kept perfectly clean and dry. All drains, necessaries, and water-closets, should be kept as clean as

possible, and should be thoroughly purified before cholera comes into the neighborhood. Such cleansing and disinfection give the surest protection against pestilential epidemics.

It must be borne in mind, however, that although the so-called disinfectants are very useful when properly applied, they are not, by any means, infallible preventives of disease.

Dr. Baxter,[1] from careful experiments, arrives at the following opposite conclusions in regard to disinfectants: No virulent liquid can be considered disinfected by carbolic acid unless it contains at least two per cent. by weight of the pure acid. When disinfectants are mixed with a liquid it is very important to be sure that they are thoroughly incorporated with it, and that no solid matters capable of shielding contagion from immediate contact with its destroyer be overlooked. Aerial disinfection, as commonly practised in the sick-room, is either useless or positively objectionable, owing to the false sense of security it is calculated to produce. To make the air of a room smell strongly of carbolic acid by scattering carbolic powder about the floor, or of chlorine, by placing a tray of chloride of lime in a corner, is, so far as the destruction of specific contagion is concerned, an utterly futile proceeding. According to his views the practical result of these experiments goes to prove (1) that dry heat, when it can be applied, is probably the most efficient of all disinfectants; (2) that the old plan of stopping up crevices and fumigating with sulphur and charcoal is more efficacious than any other proceeding with more modern disinfectants; (3) that the use of carbolic vapor for disinfecting purposes should be abandoned, owing to the relative feebleness and uncertainty of its action.

[1] Med. Times and Gazette, July 29, 1876.

Disinfectants in Common Use.

There are three important classes of disinfectants, each having specific uses as mentioned above. Some of these purifying agents accomplish only one object, others accomplish two or more objects; some may be advantageously combined; others are incompatible with each other, and must not be used together.

Class I. *Positive Disinfectants that quickly destroy or completely restrain every contagious and infectious virus.*

This class comprises the caustic acids, the acid salts of metals (soluble oxide salts), such as sulphate of iron, sulphate of zinc, etc.; carbolic and cresylic (impure carbolic) acids; which not only destroy every communicable virus of disease, but also prevent those kinds of fermentation and decay that aid in propagating epidemics. Frost destroys some infections, but preserves many others, while boiling or high steam heat destroys all contagious matter. It will be observed that no one of these agents, singly, is applicable to everything and every place that may require disinfection.

Class II. *Antiseptics, comprising chemical agents that arrest or wholly prevent fermentation and decay.*

This is a large class, and embraces carbolic and salicylic acids, and most of the agents of the first class; but not every antiseptic substance or gas (common salt or chlorine, for example) can absolutely prevent the fatal operation of epidemic infections.

Class III. *Deodorants, absorbents, etc., comprising all the chemicals that deodorize or destroy putrid exhalations, or that absorb moisture and gases.*

Charcoal, quicklime, and chlorine are good examples of this group.

Each of these three classes, and each disinfecting

agent, has its proper uses, and, as it is frequently important that these threefold means of disinfection should be applied at once to a given place or source of disease, the chemical properties of the several agents must be regarded. For example, it should be remembered that chlorine and the common alkaline compounds do not destroy the cholera infection; also, the fact that, if permanganate salts, carbolic acid, and chlorine be used together, or if the first two of them be mixed, they will simply destroy each other, and leave the infection undestroyed.

Volatile Disinfectants.—Carbolic acid on any surfaces from which it will evaporate, or from which it may be vaporized by steam-heat, and the sulphurous acid fumes, are examples of disinfectants belonging both to the *first* and the *second* class. Bromine and nitrous acid have similar powers, but should be used only by medical officers.

Of the volatile deodorants in Class III., chlorine is the chief, and though useful for certain purposes in the other classes (I. and II.), if intensely concentrated, it is principally useful to destroy other gases and temporarily to arrest decay. It seems not to have power to destroy the infectious property of cholera, smallpox, and the cattle-plague, while the vapor, as well as the strong solution of carbolic acid, is believed by some to have the power of arresting the infectious activity of all of them. This view, however, as already stated, is not universally accepted.

How to Use Disinfectants.

Brief mention may now be made of the proper methods of using some of the most important of the above agents.

The methods of disinfection which are here described

are preferred simply because they are effectual, safe, easily applied, and not expensive. They have been thoroughly tested, and are in accordance with the latest experience.

1. *Quicklime.*—To absorb moisture and putrid fluids, use fresh stone-lime finely broken; sprinkle it on the place to be dried, and in damp rooms place a number of plates or pans filled with the lime-powder; whitewash with pure lime, and not with kalsomine.

2. *Charcoal Powder.*—To absorb the putrid gases, the coal must be *dry and fresh*, and should be combined with *lime;* this compound is the *calx-powder*, as sold in the shops.

3. *Chloride of Lime.*—To give off *chlorine*, to destroy putrid effluvia, and to stop putrefaction, use it as lime is used; and if in cellars or close rooms the *chlorine gas* is wanted, pour strong *vinegar* or diluted *sulphuric acid* upon plates of chloride of lime occasionally, and add more of the chloride.

4. *Sulphate of Iron* (*Copperas*) *and Carbolic Acid.*—To disinfect necessaries, cesspools, drains, and sewers, and especially the vessels, grounds, or places in which the discharges from the sick with cholera and diarrhœal diseases are evacuated, dissolve eight or ten pounds of sulphate of iron in five gallons of water, and add a pint of fluid carbolic acid (if it can be had); stir or agitate it briskly, to make a complete solution. The uses of this solution in infectious diseases will be given hereafter.

5. *Permanganate of Potassium.*—To be used in disinfecting clothing and towels from patients sick with cholera, scarlatina, typhus or typhoid fevers, during the night, or when such articles cannot be instantly boiled: throw the soiled articles immediately into a tub of water in which there has been dissolved an ounce of the permanganate

salt to every three gallons of water. Boil the clothing as soon as it is removed from this colored solution, or boil them in it. The permanganate salts must not be used with the carbolic or coal-tar disinfectants. It is also best that chlorine and the chlorides should not be used at the same time or in contact with the latter class of substances.

6. *Sulphate of Zinc.*—The Weimar Conference recommended that sulphate of zinc should be used precisely as we use permanganate of potassium. The zinc solutions need to be much stronger than those of the permanganate: use at least two ounces of *sulphate of zinc* to one gallon of water. It must be remembered that, if any of these solutions are very strong, they would destroy clothing. At the best, they are but temporary substitutes for disinfection by boiling.

7. *Carbolic Acid* (*Fluid*).—This may be diluted at the rate of from forty to one hundred parts of water to one of the fluid acid. Use this solution for the same purpose as copperas is used; also, to sprinkle upon any kind of garbage or decaying matter, and on foul surfaces, or in drains. When used to disinfect clothing, carbolic acid of a pure quality should be thoroughly mixed with its own quantity of strong vinegar, and next be dissolved in one hundred times its own quantity of water before the clothing is immersed in it. This mixture with vinegar insures such complete solution of the carbolic acid, that the clothing will not be burned by undissolved drops of acid when disinfected in the carbolic-water. This weak solution (one part to one hundred) will not injure common clothing, but the acid must be of good quality and free from tarry matter. The clothing, etc., will long retain the offensive odor of the acid, except in articles

that can be immediately washed out in a strong solution of soap and soda.

If it should be desirable to destroy certain articles and their infection together, without fire, then saturate them with the acid, or use it diluted in ten to thirty times its own quantity of water. The disinfecting and antiseptic power of good carbolic acid is so great that one part of it to one hundred parts of water is sufficient for ordinary disinfecting solutions. For ordinary purposes in disinfecting clothing, the zinc solution is preferable to that of carbolic acid.

For drains, sewers, foul heaps, stables, necessaries, and cesspools, the cheap "dead oil" of coal-tar, or the crude carbolic acid, answers every purpose when freely applied. Coal-tar itself is available as a disinfectant or antiseptic paint for the walls of stables, necessary-vaults, and drains. By mixing with sawdust or dry lime, coal-tar or crude carbolic acid may be used on foul grounds or heaps of refuse.

The carbolic and cresylic "acids" are derived from coal-tar. Chemically considered, they are *alcohols*, and not acids. In market they are called by the first name —carbolic acid—and are frequently much adulterated or very impure in consequence of the naphthaline and tarry matters that dissolve in this kind of alcohol. The impurities do not dissolve in water. Coal-tar and the "dead oil" of coal tar derive their disinfecting power from the "carbolic acid," of which the tar contains two or three per cent., and the dead oil contains five to twelve per cent. The impurities and adulterations of the crude "acids" make it desirable for sanitary officers to know the *percentage of crystallizable acid* in the carbolic fluids or disinfecting powder they use. Crude carbolic acid, containing fifty per cent. its weight crystallizable, is not

expensive, and is a good disinfectant for grounds, drains, or the air of a foul place in which cholera or any pestilential disease exists. Dilute or thoroughly agitate the acid in forty to one hundred parts water, and completely saturate the grounds, the surfaces, and foul things in the infected neighborhood. Streets, court-yards, drains, and sewers may be quickly and effectually disinfected in this manner. The sprinkling of streets and gutters with a cheap solution of the acid has proved very useful in damp, hot weather. Add sulphate of iron whenever it is practicable.

8. *Other Disinfectants*, such as the solutions of *Sesquichloride of Iron*, or of *Chloride of Zinc*, are effectual in necessaries and drains, and upon foul surfaces and offensive materials. These metallic chlorides, combined with a twentieth part of carbolic acid, are most valuable disinfectants. A solution of *Iodine*, gr. ij, and Iodide of Potassium, gr. xx, in f℥iv of water, kept in an open vessel at a high temperature, has been employed as a disinfectant in scarlatina. *Carbolates of lime* and *carbolic powders* do not contain sufficient carbolic acid to render them important.

9. *Boiling or High-steam Heat.*—Whenever foul clothing and infected things can be boiled, or have a boiling heat steadily applied and kept up for an hour, this is one of the simplest and best modes of disinfection. But, until such high heat is actually applied to the infected things, some one of the disinfecting solutions must be used. A common steam tub (in a laundry, or elsewhere), with a tight cover, is a good disinfecting vat; but the temperature must be kept boiling-point.

Solution of Nitrate of Lead is another excellent disinfectant.

Places that must be Disinfected, and how to Disinfect them.

Water-closets, necessaries, close-stools, bed-pans, etc.—For general disinfection use either of the substances, 4 or 7, as described in the numbered sections of the foregoing directions.

Cellars, vaults, stables, or any damp or offensive places.—Use 1, 2, 3, 4, or 7, in any manner suited to the objects to be attained, as described in these directions.

Sick-rooms, bedrooms, and closets.—Ventilate and keep clean, and use substances described in sections 1, 2, or 3, according to directions.

To disinfect water-closets, necessaries, waste-pipes, and all kinds of drains and foul places in houses, stables, and yards, and especially in any drain or sewer that is liable to become offensive, *use a strong solution of copperas* (*sulphate of iron*) alone—in the proportion of two or three pounds to a gallon of water—or combined with *carbolic acid.* This solution may be made by mixing eight pounds of dry copperas and a pint of fluid carbolic acid in five gallons of water, and stirring the mixture briskly.

To keep necessaries and water-closets from becoming infected or offensive, pour a pint of this solution into every water-closet, pan, or necessary-seat morning and evening, or a solution of chloride of iron, one pound to a gallon of water, adding one or two ounces of carbolic acid. Garbage and garbage-tubs should be daily disinfected with this fluid.

Public urinals should be kept clean with a constant current of water; chloride of lime may be sprinkled on the pavement near by, the chlorine of which decomposes the ammonia of the urine as formed. Where disinfectant irrigation is necessary, a sprinkling mixture employed for disinfecting streets and gutters will be efficient, the proportions of which are as follows: 40 gallons of the ferrous chlorate liquor (formed by the action of

muriatic acid and iron on tin clippings), 4 gallons of impure carbolic acid, 83 per cent. strength, to 300 gallons of water.

To disinfect masses of filth in necessaries, sewers, or drains, gradually pour in the solution, hour by hour, until every part of the mass or foul surface has been thoroughly disinfected. To every cubic foot of filth give a pint or more of this strong solution. To every necessary and water-closet allow at the rate of one pint of this solution, to be poured daily, at evening, for every four persons that use the same. This practice to be kept up while the hot weather lasts.

If these rules be made general in all private dwellings, not only will the house-drains of such dwellings be disinfected, but the benefit will extend even to the public sewers.

The seats and floors of all water-closets in private houses, at ferry-houses, at hotels and lodging houses, on steamboats, and rail-cars, should be frequently washed with a solution of one ounce of carbolic acid in each gallon of water.

To *disinfect dwellings, hospital wards, prisons, or any locality infected with contagious germs*, metallic salts are of little benefit. Charcoal absorbs but a small portion of the mephitic gas; indeed, in such cases, the object is not so much to destroy the odors of decomposition as the infected germs, and so prevent further propagation. Fumigations of chlorine, sulphurous acid, and the vapors or spray of carbolic acid are particularly beneficial, and cannot well be replaced by any other agent. The fumigations should be practised until all animal odor disappears.[1]

To *disinfect sewers, stables, gutters, foul ditches, filthy ground, slimy surfaces of drying ponds, etc.*, or other place

[1] Dr. S. O. Vander Poel, Trans. of State Med. Soc. of N. Y., 1875, 235.

where there are great surfaces or masses of putrid matter; use the "heavy oil of coal-tar," or some one of the strongest disinfecting powders that are made from coal-tar. Heavy oil, or coal-tar, used with copperas, or used alone, is the most effectual and the cheapest disinfectant for this class of nuisances. The inside walls of foul stables, vaults, cellars, open gutters, and all such places, can be quickly and permanently disinfected by occasionally laying upon these surfaces a coating of the "heavy oil," or of the crude coal-tar.

Sewers and all foul drains can be kept perfectly disinfected by pouring into them, at as many places as possible, a small quantity of the "heavy oil," or a quantity of the strongest solution of sulphate or sesquichloride of iron mixed with a twentieth part as much crude carbolic acid, and well stirred together.

Wherever it is proper to use a powder that does not dissolve, as upon filthy heaps, and in larger drains or cesspools, stables, cellars, and the like, carbolic acid or coal-tar powders are effectual. And for use in a larger way, upon filthy masses, and drying, stagnant or foul pools, a powerful disinfectant may be made by mixing one part (by measure) of "heavy oil" with five parts of quick-lime and ten parts of sawdust, to use by covering the foul places with this mixture.

To disinfect a necessary or a quantity of earth that is contaminated with Cholera-excrement, or liable to be infected.—Use the mixed carbolic and copperas solution, saturated strength, as follows: To every cubic foot of soil or filth give two or three pints of the strong solution. To every necessary and water-closet allowed at the rate of one pint of this solution, to be poured in daily, at evening, for every four persons on the premises; this practice to be kept up while cholera is in the district or country.

This method of systematic disinfection would be useful in every household; but when cholera is present in any city or country, such thorough application of this means of protection cannot be safely neglected in any city *to which persons may come from towns where cholera is epidemic.* Sanitary chemists advise that the estimated quantity of these water-closet and sewer disinfectants required for each person daily, in the presence of cholera, should be one half an ounce of sulphate of iron and one half a drachm or one half a teaspoonful of carbolic acid.

Things to be Disinfected.

1. *Beds, bedding, and upholstered stuffs.*—Expose to sunlight and ventilation freely and frequently. If actually infected, thoroughly moisten every part with a strong solution of carbolic acid or permanganate of potassium.

2. *Soiled clothing, etc., from the sick with Cholera or any Contagious Disease.*—Use a solution of permanganate of potassium or carbolic acid, precisely as previously directed, and as soon as the soiled articles are removed from the patient; or place them in a tub containing eight ounces sulphate of zinc, three ounces carbolic acid, and three gallons of water, for one hour, and then put them in boiling water; or the clothing may be thoroughly steeped, before boiling, in a solution of two ounces of chloride of lime in a gallon of water. Or immerse them at once in boiling water. In any case of infectious disease, the clothing must be boiled previous to washing or drying. Infected clothing must be thrown into the water at boiling heat. The boiling should be kept up for an hour.

Woollen goods must be treated differently. They must be exposed for some time to the fumes of *sulphur*, and

afterwards freely exposed to the action of the sun and wind.

3. *Carpets, sofas, lounges, mattresses, floors, etc., infected by Cholera-excrement, or by Smallpox, Scarlatina, and other Contagions*, should be treated as follows:—

First. Thoroughly moisten every infected hing with one of the carbolic or permanganate solutions.

Second. *Rules for Fumigation.*—To give still greater completeness to the disinfection required for an infected apartment and thick woollen stuffs, carpets, etc., to which boiling heat cannot be applied, fumigate with sulphurous acid, thus: Arrange to vacate room for twelve hours; close every window and aperture, and, upon an iron pipkin, or kettle with legs, burn a few ounces of sulphur; the quantity required for effectual work will depend upon cubical space of the apartment, and there should be enough to burn rapidly until want of oxygen in the air shall extinguish the flame. Instantly after kindling it every person must withdraw from the place, and the room must remain closed for the succeeding eight hours. After this time the windows should be thrown open, and when the fumes have disappeared, all the woodwork and walls should be thoroughly washed with soft soap and water, to which *carbolic acid* has been added (one pint of the common liquid to three or four gallons of water), and the paper from the walls stripped off. In whitewashed rooms the walls should be scraped, and then washed with hot lime, to which *carbolic acid* has been added. The windows should then be kept open for thirty-six or forty-eight hours. If any other kind of fumigation is resorted to (as that by chlorine, bromine, or nitrous acids), a sanitary officer or a chemist should superintend the process. Fumigation should be resorted to in dwelling-houses only by official orders or permission, or under the personal

superintendence of a competent medical man, as the disinfecting gases are very poisonous.

4. Finally, let *fresh air* and *sunlight* purify every place they can reach. Open and dry all cellars and vaults, and keep the grounds and surfaces about dwellings as dry and clean as possible. Use fresh lime or the "calx-powder" freely upon wet or offensive surfaces. Flush the water closets and drains daily before throwing in the disinfectants as directed. Domestic and personal cleanliness should be everywhere observed. *There are no substitutes for pure air and water.*

Rules for disinfecting impure drinking-water will be detailed on another page; special rules for prevention of small-pox on page 335. Other important rules applicable to communities should be strictly observed during the prevalence of epidemics. The following are based on common-sense principles of self-preservation, but unless systematized for reference, some of their provisions are apt to be disregarded.

Directions for Preventing the Spread of Infectious Diseases.[1]

I. When a case of infectious disease occurs in a house, immediate notice thereof should be given to the proper officer of health, and medical advice at once procured.

The following precautions should be taken :—

1. *Isolate the person affected as much as possible from the other inmates of the house.* This is most readily effected by at once removing him to an upper room, if circum-

[1] These rules are an embodiment of the excellent paper published in the *Sanitarian*, Jan. 1877, from the pen of J. M. Maclagan, M.D., Medical Officer of Health for Hexham and Haltwhistle Unions Rural Sanitary Districts, England, and are applicable to smallpox, scarlet fever, measles, typhus fever, enteric fever, whooping cough, diphtheria, etc. Additions have been made to these directions to still further increase their efficiency.

stances permit. The room should be large and airy, and means of ventilating it at once adopted. If the sick cannot thus be separated from all other persons, the Board of Health will send the patient to hospital. Persons with smallpox must not be moved from one house to another, or to hospital, except by permission of the Board of Health.

2. Before removing the patient the following preparations ought to be made in the room : All superfluous *curtains*, *carpets*, *woollen articles*, *unnecessary clothing*, *bedding*, *etc.*—in short, *everything likely to retain infection*—should be *at once removed.*

3. The patient's *bed* ought to be so placed as to allow of a *free current of air* around it, but not so as to place it in a *draught.*

4. *The room must be kept well ventilated*, under the physician's direction, by means either of a fire (when required) or of an open fireplace and chimney, and of windows opening to the external air. By means of the latter ventilation is effectually procured, so as to avoid draughts, in the following manner: *Raise the lower sash of the window three or four inches*, *then procure a piece of wood made to fit accurately into the lower opening*, *and place it there.* By these means free outward and inward currents of air —without causing any draughts—are obtained through the vacant space between the two sashes. *When a window is merely opened from the upper or lower sash*, *draughts are invariably caused.*

5. Placing a small sheet of oil-cloth, mackintosh, or other waterproof material, beneath the upper blanket on which the patient is to rest, effectually prevents the bed from being soiled by any discharges, etc.

II. 1. After removal of the patient to the room in which he is to remain, the outside of the door and door-posts

should be completely covered by a sheet kept constantly wetted with some disinfecting solution. A piece of muslin, one foot square, should be dipped in the same solution and suspended constantly in the sick-room.

2. The room must be kept scrupulously clean. Before being swept, which should be done daily, *if possible*, the floor should be sprinkled with some *disinfecting powder*, or with a weak solution of a disinfecting fluid.

3. Vessels containing disinfecting fluids should be placed in the room for the reception of all bed and body linen, towels, handkerchiefs, etc., immediately on being removed from the patient, and on no account should they be washed along with other household articles.

4. Disinfectants, as already mentioned, should also be placed in all the chamber utensils used by the patient, and, after use, more disinfecting fluid should be added, and the whole contents, if possible, should be immediately *buried* deeply in the ground, at a distance from any drain, well, or watercourse. On no account should they be thrown on any ash-pit, dunghill, or into any cesspool. The vessel, after being thoroughly emptied, must be cleansed with boiling water. *No chamber vessel should be allowed to remain in the room after having been used.*

5. All plates, cups, glasses, etc., which have been used by the patient, should be rinsed with some disinfectant before being washed; and on no account should any vessels used in the sick-room be washed along with other things, unless previously thoroughly disinfected.

6. Attendants on the sick should be chosen, if possible, from those who have already had the disease. They should not wear woollen dresses, but only those made of washing materials. It is advisable not to use handkerchiefs about the patient, but soft rags for cleansing the nostrils and mouth, to be immediately thereafter burned.

7. Basins containing water, to which some disinfectant has been added, should be at hand for the benefit of the attendants on the sick, who should not be sparing of their use.

8. No article of food or drink from the sick-room should be consumed by other persons.

9. Visitors to the sick-room, except in the case of *clergymen* and *medical men*, should be peremptorily forbidden; and they, when necessarily present, should, on leaving, wash their hands in water to which a disinfectant has been added, and should have as little immediate communication with others as possible.

III. When a death from infectious disease occurs, the body should be wrapped in a clean sheet, and at once placed in a coffin and sprinkled with some disinfecting fluid, such as a carbolic solution, or powder, such as *chloride of lime*, *etc.*, and *buried with the least possible delay. On no account whatever should it be allowed to remain in a room occupied by living persons.*

IV. 1. *On the termination of a case of infectious disease*, either when the patient is pronounced *free from infection*, or, in the event of *death*, after *removal of the body*, the sick-room and its contents should be thoroughly cleansed and disinfected. The ceilings and side walls of the sick-room, after removal of the patient, should be thoroughly cleansed and lime-washed; and the wood-work and floor thoroughly scrubbed with soap and water. Or, if previous fumigation be thought desirable, it may be practised according to directions given on a preceding page.

2. The bed and bedclothes, and all wearing apparel used by the attendants or patient, should be *thoroughly disinfected* before removal from the sick-room.

Beds, pillows, and thick stuffs, after being soaked in disinfecting fluid, must be placed on the roof, or in an

empty room, to dry. They must not be placed in the yard or in the hall-ways. All straw beds and refuse stuff must be burned.

V. 1. In houses where a case of infectious disease occurs, no *washing*, *tailoring*, *dressmaking*, nor any similar occupation, ought to be carried on.

2. No *milk* or *food* of any kind should be supplied from infected houses. Milk has frequently been found to be a fruitful medium for conveying disease, either from having been placed in infected air, from which it has absorbed the poison, or from *milk pails* having been washed, or the milk adulterated, with water containing the infection. *Great care should therefore be taken as to the source of the household milk supply.*

3. *Children* from infected houses should not be allowed to *attend schools*, and *all persons* from infected houses should have as little communication as possible with others, either in *private houses* or in public places, such as *railways*, *omnibuses*, *public-houses*, *churches*, *etc.*

4. Any accumulation of *filth* or *refuse* of any kind should be at once removed from or about the premises, and *disinfectants freely used.* If this cannot be done by the persons themselves, immediate notice should be given to the sanitary authorities.

5. Open and thoroughly ventilate cellars, garrets, closets, sleeping-rooms, and all other apartments, and keep them clean and dry. Observe the utmost cleanliness in basements, areas, and grounds about the house.

6. The existence of nuisances of any kind and wheresoever situated should also be at once reported. In the event of *sewer gas*, continued *offensive odors*, or *constant sickness* occurring in a house, proper workmen should be obtained in order to see if any structural defects exist in

sinks, drains, water-closets, necessaries, etc. If such should exist, disinfection merely will be of no avail.

Directions to Persons in charge of the Unburied Dead from Infectious Disease.[1]

Cleansing.—In cleansing the surface of the corpse, especially the parts most soiled by discharges, use the solution of *chlorinated soda* (Labarraque's solution, of the shops), a pint to two quarts of hot water. A solution of *chloride of lime*, made by straining or decanting a gallon of water into which a pound of that substance has been thrown, answers the same purpose. This cleansing is required for the whole person in every case of death from *cholera*, *fever*, *scarlatina*, or *smallpox.* Cloths, sponges, etc., employed about the dead must be instantly burned or boiled.

Disinfection.—Fill a large wad of cotton or fine shavings with two pounds of coal-tar powder, or chloride of lime, and place it beneath the hips; and, in cases of cholera, place much more of this kind of absorbent material beneath the corpse, to absorb and disinfect the purged fluids that may flow.

Directions in the Family.—Whatever disease has caused the death, order every garment and cloth that was used upon the dead person, and in cholera and infectious fevers, *whatever was about the person* or was *soiled* during sickness, to be immediately boiled, or, until boiled, to be kept in one of the disinfecting solutions. Ventilate every room and closet upon the floor where a death has occurred from an infectious disease. Keep windows and fireplaces open for several days.

Burials.—The dead of cholera should be interred as soon as practicable, and always *within thirty-six hours after death.*

[1] From the report of New York Board of Health for 1873.

How to Prevent the Spread of Small-Pox.

Although there is no contagion more powerful or certain, experience has taught that the spread of small-pox may be absolutely prevented by a strict observance of the following Rules :—[1]

1. On the first report of the existence of a case in a region, systematic vaccination or re-vaccination of every member of the exposed communities in such region should be at once resorted to.

2. Whenever it is known that any person is sick with small-pox or varioloid, isolation of the individual should be promptly and rigidly enforced. Every one in the house should be vaccinated or re-vaccinated, no matter how recently this may have been done, nor how mild the disease may appear. In towns or cities where there are small-pox hospitals, it is better that the patient should be removed to such at once. Where there is no such provision, the infected house should be strictly quarantined, and, if necessary, the police authority must be invoked to secure proper restrictions. An improvised hospital will be an absolute necessity if the case occurs in a crowded family or tenement-house, where proper isolation cannot be secured. In such case, a barn, outhouse or other building may be made sufficiently comfortable for the patient, at small expense ; or, if the weather be mild enough, a tent may be used. A flag or placard, bearing the words "SMALL-POX" should be prominently displayed upon the house, and not removed until permission is given by the health authorities. *Isolation is a matter of the utmost importance.*

3. The room selected for the sick should be large, easily ventilated, and as far from the living and sleeping-rooms of other members of the family as it is practicable to have it.

[1] Prepared for the Illinois State Board of Health, in 1881, by Dr. John H. Rauch, its Secretary.

All ornaments, carpets, drapery, and articles not absolutely needed in the room, should be removed. A free circulation of air from without should be admitted, both by night and day; there is no better disinfectant than pure air. Care should, of course, be taken to keep the patient out of draughts.

4. All discharges from the nose and mouth of the patient should be received on rags and immediately burned, and the same precaution should be taken with the crusts as they fall off. Night-vessels should be kept supplied with a pint or two of solution of carbolic acid—one gill of crude carbolic acid to half a gallon of water; or of chloride of zinc—an ounce and a half of the chloride to half a gallon of water. The discharges from the kidneys and bowels, received in these vessels, should be buried at least one hundred feet from any well or spring. All spoons, dishes, etc., used or taken from the sick-room, should be put in boiling water at once. Cleanliness in everything must be scrupulously enforced.

5. Not more than two persons—one of them a skillful professional nurse, if possible—should be employed in the sick-room, and their intercourse with other members of the family and with the public must be as much restricted as possible. In the event that it becomes necessary for an attendant to go out of the house, a complete change of clothing should be made, using such as has not been exposed to infection; the hands, face and hair should be washed in water, to each half gallon of which has been added a tablespoonful of spirits of thymol,[1] or two tablespoonsful of carbolic acid, or half a gill of a ten per cent. solution of permanganate of potassium. Following this, free exposure to the open air should be secured before approaching any one.

[1] *Spirits of Thymol*, for this purpose, may be made by adding one ounce of thymol to three ounces of alcohol, 85 per cent. This disinfectant is free from the disagreeable odor of carbolic acid, and is quite as efficient.

6. Physicians and other necessary visitors, before entering the sick-room, should put on an outer garment, closely buttoned up, and a handkerchief or wrap about the throat and neck. Such outer garment may be a linen duster or rubber overcoat; and this, together with the neck-wrap, should be taken off in the open air immediately after leaving the sick-room, and either be dipped in the disinfecting fluid hereafter described, or hung up out of doors until the next visit. Safety consists in exposing to the open air every article of clothing that has been in any way subject to the contagion.

Whenever practicable, the precautions above prescribed (*Rule* 5) for an attendant leaving the sick-room should be observed by the physician or visitor. Doctors or clergymen may convey contagion as readily as the laity, under similar conditions; they should, therefore, take the same precautions.

7. No inmate of the house, during the continuance of the disease, should venture into any public conveyance, or assemblage, or crowded building, such as a church or school; nor, after its termination, until permission is given by the attending physician. Letters should not be sent from the patient, and all mail matter from the house should first be subjected to a dry heat of 250-260 degrees Fahr. Domestic animals, dogs, cats, etc., should not be allowed to enter the room of the patient, or, better still, should be excluded from the house.

8. After recovery has taken place the patient should be bathed daily, for three or four days, in a weak disinfectant—the thymol water above described, or a solution of the chloride of zinc (two drachms of the salt to half a gallon of water). The head should be thoroughly shampooed during each bath, and the convalescent be then clothed in fresh, clean garments that have been in no way exposed to the infected air. Some time must elapse—ten to fourteen days, according to the severity of the case—before the danger of communicating

the disease is past, and patients should be kept in the house at least two weeks after the crusts have all disappeared.

9. In the event of death, the clothing in which the body is attired should be sprinkled with strong carbolic acid, and the body wrapped in a disinfectant cerecloth[1] and placed in an air-tight coffin, *which should remain in the sick-room until removed for burial.* No public funeral should be allowed, either at the house or church, and no more persons should be permitted to go to the cemetery than are necessary to inter the corpse.

10. After recovery, or death, all articles worn by or that have come in contact with the patient, together with the room and all its contents, should be thoroughly disinfected by the burning of sulphur or the pouring of crude carbolic acid on chloride of lime. To do this, have all windows, fire-places, flues, key-holes, doors and other openings securely closed by strips or sheets of paper pasted over them. Then place on the hearth or stove, or on bricks set in a wash-tub containing an inch or so of water, an iron vessel of live coals, upon which throw three or four pounds of sulphur; or place a number of plates of chloride of lime (say six feet apart), in different parts of the room, and pour on them crude carbolic acid. All articles in the room, and others, of every description, that have been exposed to infection, and are too valuable to be burned, yet cannot be washed nor subjected to dry heat, must be spread out on chairs or racks; mattresses or spring beds set up so as to have both surfaces exposed; window-shades and curtains laid out at full length; and every effort made to secure thorough exposure to the sulphur or chlorine fumes. This room should then be kept tightly closed for twenty-four hours. After this fumigation—which it will do no harm to repeat—the

[1] This may be a sheet thoroughly soaked in the disinfectant fluid described in Rule 11—only of double strength; that is, *eight* ounces sulphate of zinc and *four* ounces common salt to *one* gallon of water.

floor and woodwork should be washed with hot water, the walls and ceiling whitewashed, or, if papered, the paper should be removed. The articles which have been subjected to fumigation should be exposed for several days to sunshine and fresh air. If the carpet has unavoidably been allowed to remain on the floor during the illness, it should not be removed until after the fumigation, but must then be taken up, beaten and shaken in the open air, and allowed to remain out of doors for a week or more. If not too valuable, it should be destroyed; but, whenever practicable, it should be removed from the room at the beginning of the illness. After the above treatment has been thoroughly enforced, the doors and windows of the room should be kept open as much as possible, for a week or two. Where houses are to some extent isolated, judgment can be used in exposing articles out of doors. The entire contents of the house should be subjected to the greatest care, and when there is any doubt as to the safety of an article *it should be destroyed.* The privy should be thoroughly disinfected, during the entire illness, with copperas solution—prepared by dissolving about sixty pounds of copperas (suspended in a basket) in a barrel of water; three to five gallons of this solution, to which may be added a pint of crude carbolic acid, should be thrown into the vault every three or four days. Water closets should be disinfected by pouring a quart or so of this solution into the receiver after each use.

11. Such articles of clothing, bedding, etc., as can be washed, should first be treated by dipping in the following disinfecting fluid:—

Sulphate of zinc	24 ounces,
Carbolic acid	4 " or
Common salt	12 "
Water	6 gallons.

A pail or tub of this fluid should be kept in the sick-room, and into this all clothing, blankets, sheets, towels, etc.,

used about the patient or in the room, should be dropped immediately after use, and before being removed from the room. They should then be immediately and thoroughly boiled. The ticking of beds and pillows used by the patient should be treated in the same manner; and the contents, if hair or feathers, should be thoroughly baked in an oven. If this cannot be done, they should be destroyed by fire, as should, in any event, all straw, husk, moss, or "excelsior" filling. The clothing of nurses should be thoroughly fumigated and cleansed before it is taken from the house, and better still, burned, if circumstances will admit.

12. If, from neglect or delay in enforcing precautionary measures, the disease shows a tendency to become epidemic, the public and private schools should be closed, church services suspended, and public assemblages of people, as at shows, circuses, theatres, fairs, or other gatherings, should be prohibited.

The above precautions, if faithfully carried out, may be confidently relied upon to prevent the spread of the disease, and the intelligent confidence thus secured will prevent panic and the inhuman treatment of the afflicted, which so often arises from ignorance and unreasoning fear.

DIRECTIONS FOR THE USE OF THE HYPODERMIC SYRINGE, GALVANIC BATTERY, TRUSSES, ETC.

HOW TO USE THE HYPODERMIC SYRINGE IN DISEASES IN WHICH IT IS APPLICABLE.[1]

Physicians of the present day carry in a pocket-case more active elements of prompt medication than used to be packed in a good-sized pair of saddlebags of a quarter century ago; and these modern condensed preparations for subcutaneous injection, as we all know, in many respects supersede the old fashioned way of administering medicines.

In cases of unconsciousness, delirium, strangulation, or other condition in which the patient cannot or will not swallow, the proper remedy, in nicely graduated quantity, injected hypodermically, answers just as well as if taken into the stomach; and, in many cases, even when the patient can take remedies in the usual way, hypodermics respond more promptly and favorably than other plans of treatment.

We give the following list as embodying the principal conditions in which hypodermics have been employed:—

Abortion has been caused by hypodermics of pilocarpine. This should insure caution.

Arrest of Perspiration. Pilocarpine, the alkaloid of jaborandi, will cause more or less profuse sweating, according to amount injected beneath the skin.

Bubo has been aborted by injecting carbolic acid into the centre of the swelling.

Carcinoma. Acetic acid one part to three of water, injected into the cancer, has proved successful in shrivelling the tumor, and obviating an operation.

[1] Quoted from the National Medical Review, 1879.

Cerebral Apoplexy has been successfully treated by subcutaneous injections of ergotine in the arm.

Chloroform-poisoning. One-tenth grain of digitaline, hypodermically, followed an hour afterward with one-tenth grain of atropia in similar manner, has been suc-successful.

Chorea. Curare, in hypodermies of from one-tenth to one-twentieth of a grain daily, has been found valuable in this disease.

Congestive Chills. Ten drops of tinct. belladonna, hypodermically, every fifteen minutes, until the pulse became distinguishable, succeeded where the patient was unconscious and unable to swallow, followed by hypodermies of quinine, brandy, or whiskey.

Croup. Sulphate of atropia, one per eent. solution, has proved successful in a desperate case, injected in the neck on level with pneumogastric. Three drops, repeated after four hours.

Dysentery. Morphia, hypodermically, in one-third grain doses, has been found more rapid in relieving tenesmus than any other opiate.

Epilepsy. Curare, in solution, seven grains in twenty-five minims water, with two drops hydrochloric acid. About once a week inject about eight drops beneath the skin. It has cured cases of several years' standing within two months.

Eczema. Arseniate of soda, hypodermieally, in solutions of one-fifth, one-half, and one per eent., commencing with ten mimims of the weaker and gradually increasing, is recommended.

Erectile Tumors have been successfully treated by injections of perchloride of iron and chloride of sodium in solution, the tumor to be surrounded by a ring.

Erysipelas. Carbolie acid, three per eent. solution, eight

or ten injections at the same time, so as to surround and cover the inflamed regions; also, salicylic acid in the same manner.

Foreign Body in Œsophagus. Threatened strangulation from impaction of gullet has been promptly relieved by inducing vomiting. Apomorphia, one-tenth grain, hypodermically. Emetina is also suggested in same way.

Goitre has been successfully treated by subcutaneous injections of ergotine, one-third, gradually increased to one grain.

Hæmoptysis. Sclerotinic acid, substitute for ergotine, five per cent. solution injected in the neck or arm.

Hemorrhages. Hæmoptysis, hæmatemesis, and uterine hemorrhages have all been arrested by hypodermics of ergotine. If pain, add morphia.

Hernia is more easily reduced by giving a hypodermic of morphia with or without atropia.

Hiccough. In an obstinate case, resisting all other means, three-eighths grain of chlorohydrate of pilocarpine, hypodermically, quickly proved successful.

Hydrophobia. Much amelioration of the symptoms has followed hypodermics of curare.

Infantile Convulsions. Morphia, subcutaneously, with inhalations of five drops of nitrite of amyl immediately following, have proved successful.

Membranous Croup. Equal parts of water and sol. ferri perchlor. injected into the trachea, piercing the needle through just below the thyroid cartilage .this dissolves the membrane, and assists its expectoration, and is thus a substitute for tracheotomy.

Nasal Polypus. Carbolic acid, one part; glycerine, four parts; twenty drops sunk into tumor by means of hypodermic syringe effectually dissipated polypus in case reported.

Night-sweats. Atropia has given good results in injections of about one-fortieth of a grain at bedtime.

Nocturnal Enuresis. Two very small doses of the nitrate of strychnia, injected in the vicinity of the rectum at suitable intervals, have proved successful.

Obstruction of the Bowels. Aloin has been used with success, subcutaneously, to move the bowels.

Opium-poisoning. Quite rapid recovery is reported to have followed *warm* hypodermics of fluid extract coffee in thirty minim doses. Caffeine citrate and sulphate of atropia are also considered antidotes to opium.

Puerperal Convulsions. Chloral, subcutaneously, has been pronounced better than when swallowed.

Puerperal Eclampsia. Veratrum viride, two to four drops of the tincture, subcutaneously, as required to keep the pulse down to about sixty. Pilocarpine, two per cent. solution, is also recommended.

Retention of Urine from paralysis of the bladder, accompanying typhus, variola, and hydrocephalus, has been promptly overcome by hypodermics of ergot in the fossa behind the great trochanter.

Skin Diseases caused by Animalculæ. Sulphuric, carbolic, salicylic, or sclerotinic acids, hypodermically, as in erysipelas.

Snake-bites. Ammonia, brandy, carbolic or salicylic acids are all recommended, hypodermically, in case of snake-poison, and have been injected with benefit directly into a vein.

Strychnia-poisoning. Caffeine, one grain, hypodermic; alcohol in the same way is also suggested; chloral injections are also mentioned.

Surgical Shock. Quinine, six grains, hypodermically, with one-third grain of morphia.

Suspension of Salivary Secretion. Pilocarpine, used as heretofore explained, excites salivation.

Syphilis has been treated by solutions of some of the mercurials, injected locally.

Tetanus. Chloral hydrate is recommended in connection with chloroformization, alternating it with other anodynes and antispasmodics.

Trichinosis. Tincture of ergot and ergotine have effected speedy cures, hypodermically, into muscles affected.

Tumors. Just before removal, hypodermic of half grain of morphia, with a thirty-sixth grain of atropia, directly into the growth.

Ununited Fractures. Glacial acetic acid, five to ten minims, between ends of the bones, with hypodermic syringe. Iodine has also succeeded, used in same way.

Urticaria. Saturated solution of bisulphite of soda injected directly into the part affected.

HOW TO USE A GALVANIC BATTERY IN MEDICINE AND SURGERY.[1]

Varieties of Electricity.—We make use of three varieties of electricity in medicine:—

Firstly, of static or friction electricity, the electricity of glass and amber, appropriately called from its early investigator, *Franklinism.*

Secondly, of the electricity of chemical action, *Galvanism*, or better, *Voltaism*, the "*Constant Current.*" Unless artificially interrupted, the electricity flows continuously until the battery is exhausted, just as a stream of water flows from an ordinary water pipe; and

[1] Condensed from a Discourse on Electro-therapeutics, by H. Tibbits, M.D., London, 1877. With so many instruments in the market, it is obviously impossible to enter into the details of individual batteries.

Thirdly, of *Faradism*, the induced currents of momentary duration which are generated or "*induced*" in a coil of wire by the action upon it, under certain circumstances, of a magnet or of a voltaic current. There is no steady flow of electricity, but instantaneous currents only. These are repeated many times in a second, and they flow in alternate directions, as in the magneto-electric machine.

It may be well to call to mind for a moment that electricity *per se* is not a panacea, but simply a remedy, most valuable, it is true, but only in appropriate cases, and in suitable doses; and that it produces very opposite effects, not only according to its variety, *but according to its method of administration.* The galvanic current, applied with intermissions—that is, by moving the conductors during the application—differs altogether in its effects from the very same current applied as a constant current, that is, without intermissions, or with immovable conductors; and Faradism, or the induced current, differs again, *in toto*, from either of these.

Static electricity, though sometimes of the utmost value, has certain inconveniences in its application, and is little used by specialists.

Electrical Instruments.—A clear comprehension of the mechanism of batteries is essential to their pleasant and successful use, and to the easy detection and rectification of faults in their working. Insufficient information upon these points goes far to explain why it is still too common for the medical practitioner (as quoted by Golding Bird, nearly thirty years ago), to consider that when his fiat has gone forth "let the patient be electrified," he has done all that is necessary, while the patient usually carries out his mandate by the purchase of a rotary magneto-electric machine, using it according to the directions

of its maker, who is generally about as well fitted to teach its application in disease as is the maker of an amputating knife to operate with it!

In electrization the source of electricity is furnished by a cell or cells with contained elements and chemicals. Until quite recently, it was impossible to get a *portable* cell that remained always in order, and ready for use; from an early period of my electrical experience I have suffered much from batteries—from instruments "striking work" at the most inconvenient moment—from spilling of corrosive acid upon fingers and clothing; but the invention of the "Leclanché" cell has done away with all these petty annoyances.

The "Leclanché" cell consists of a zinc plate inserted in powdered sal-ammoniac and a carbon plate inserted in powdered peroxide of manganese, in a porous cell; and, although it is requisite for this sal-ammoniac to be in a semi-fluid condition, and it will not admit of being left turned quite upside down, it does not suffer from being accidentally overturned, if replaced immediately. Leclanché cells are remarkable for their constancy and persistency in action, and they will remain, with ordinary work, in full efficiency for many months, and can then be readily recharged. They are the only cells that do not require some arrangement by which the elements are either lowered into the exciting fluid, or this is raised to them; and they are necessarily free from the chance of destruction by their elements being inadvertently left in this fluid—a frequent accident with other batteries.

The Application of Electricity.—I shall use the term "electrization" in all remarks applicable equally to Voltaism and Faradism.

Electrization may be applied generally and locally; it may be arrested in the skin without stimulating the sub-

jacent organs; or, on the contrary, it may be caused to penetrate the skin, and made to concentrate its power on deeply-seated muscles or nerves. The skin itself is a non-conductor of electricity, and if it be carefully dried and powdered with some absorbent powder, the dry metallic conductors of an electrical instrument, in moderate action, applied to it, will produce only sparks and crackling, but no physiological phenomena. *The electricity does not penetrate the skin.* If the dry conductors are replaced by well moistened sponges, there will be produced neither sparks nor crackling, but very variable phenomena of contractility or sensibility, according as the electricity acts upon a muscle, a nerve, or an osseous surface; and this brings us to the consideration of conductors.

Different kinds of Rheophores.—The varieties of conductors are infinite. The most essential are well-moistened sponges contained in cylinders; metallic disks covered with wet work-leather; the same metallic disks, polished, and not covered with leather; and a brush of metallic wire; all having conveniently shaped handles: and, of course, some form of conducting cord or wire between these conductors and the poles of the instrument. I have had endless trouble with conducting cords, which are always liable to get out of order, and cause interruption in the current; and I strongly advise that nothing should be used but very thin copper wire, coated with gutta-percha, in the same way as that known as "telegraph wire." This is perfectly insulated, sufficiently pliable for all practical purposes, is inexpensive, does not kink, will fit any sort of rheophore, and if the end breaks, all that is necessary is to scrape off with a pocket-knife the coating for about a couple of inches from the broken end. For use, where the rheophores remain immovable during the

whole time of application, the ordinary telegraph wire is more convenient, and from its much greater diameter will wear much longer; but it is not sufficiently flexible for other purposes. Most sponge holders are made much too long in the cylinder, the proper dimensions for general use being about $1\frac{1}{2} \times 1\frac{1}{8}$ inch, and the sponge should be large enough to fit the cylinder tightly, or it will be apt to slip out, and when not in use it should be taken out of the holder and kept in water until required again. Conductors, with fixed sponges, although convenient, soon become fouled, and interrupt the current, unless the sponges are frequently renewed. The disk rheophore covered with wash-leather is very generally useful, and by using the edge it may be made to answer, in the majority of cases, for a pointed conductor. It has also an advantage over the sponge of allowing firm pressure to be made without the inconvenience of water being squeezed out.

Methods of Applying Electricity.—The voltaic current is applied as a "constant" and as an "interrupted voltaic" current. In the "constant" voltaic current, the conductors are maintained immovable upon the skin; or the feet or hands, as the case may be, are immersed in tepid water, with which the conducting wires of the battery are in contact, and the current is allowed to pass during the time required. The tension of voltaic electricity is so low that salt is needed to render the water a good conductor. In the "interrupted voltaic current," the current is interrupted by gliding over the skin one or both rheophores, or keeping one rheophore stationary, and lifting and reapplying the second at intervals of about one to two seconds.

Radcliffe's Positive Charge.—This is an application of *positive* voltaic electricity, originated by Dr. Radcliffe. The patient and the battery must both be insulated, the passage

must be constant, and a wire, termed a "ground wire," must be carried from the negative pole of the battery or from the negative rheophore to the earth; that is, there must be two wires from the negative pole, one to be applied as well as the positive to the patient, and the other taken "to tearh." This latter may conveniently be attached to a metallic chandelier, or gas pipe, which always gives direct metallic conduction to the ground. With careful insulation, the negative electricity passes away by this wire, and while the current circulates, the patient continues "charged" with positive electricity. A sheet of gutta-percha, about four feet square by half an inch thick, will answer admirably to insulate the patient, and the accessories. It is often convenient, in making this application, to insert the hand or foot of the patient, as the case may be, in a vessel containing tepid salt and water, in which is immersed the wire from one pole, while the sponge from the other pole is held applied to some part of the body, the operator taking care not to touch the patient, or the insulation would be destroyed; but to hold the sponge holder by its insulating handle only; or a second limb is immersed with the wire from the second pole in another vessel of salt and water. Administered thus, this is especially an "electric bath" of positive electricity.

Direct Muscular Electrization, termed by the German school "intra-muscular," consists, as the name implies, in electrizing a muscle by placing the rheophores on the muscle itself; and is accomplished by placing well-moistened rheophores on points of the skin corresponding to the muscle it is desired to act upon. The rheophores must be applied over the fleshy body of the muscle, and not over its tendons; and they should be applied in succession to all points of its surface, and the thicker the substance of the muscle, the more intense must be the

current, because a weak current will only produce excitation of the superficial layers. Using Faradism, it is a good rule to promenade, as it were, the two rheophores, held in the same hand, in lines along and across the muscle, or group of muscles, keeping them stationary on *every point of the muscle* for about thirty seconds, and letting the entire application vary from five to fifteen minutes, according to therapeutic requirements. Using interrupted voltaism, it is better to maintain the positive rheophore stationary, and to "paint," as it were, the entire muscle with the negative glided in lines from the positive. With constant voltaism both rheophores must be held immovable.

Indirect Muscular Electrization, termed by the German school "extra-muscular," consists in causing muscular contraction by acting upon the special nerve trunk and branches, instead of by placing the rheophores upon the muscle itself. When it is desired to act exclusively upon the nerve, it is convenient to place a broad conductor, such as a sponge contained in a cylinder, upon some little sensitive part of the body—such as the sternum—and to apply a fine-pointed conductor to the most superficial point of the nerve it is desired to act upon; but in practice it is often better to place the larger conductor upon the muscle itself.

Electrization of Central Organs of Nervous System.—The voltaic current is the only form of electricity which exerts any special action on the central nervous system. To affect the brain, well-moistened sponges may be applied to each mastoid process, to each temple, or to the frontal and occipital protuberances. The sponges must be held immovable. To galvanize the superior cervical ganglion of the sympathetic, one electrode, of small size, must be deeply pressed into the auriculo-maxillary fossa, and the

other with a good-sized sponge applied over the sixth or seventh cervical vertebra, or to the manubrium sterni, close to the border of the sterno-mastoid.

The spinal cord may be electrized by keeping one sponge—usually the positive—stationary, and moving the other up and down by the sides of the vertebræ, or one pole may be applied to the spine, and the other held to a nerve or muscle.

Cutaneous Faradization.—When it is desired to act only upon the skin, faradization is invariably made use of. The solid metallic disks, but polished, and without leather, may be applied by their metallic surfaces to the skin, and either kept stationary or moved over it with greater or less rapidity, in proportion to the degree of irritation it is required to produce; or the wire-brush may be substituted for one of the disks, and moved over the skin, the other disk being held stationary. The skin should be carefully dried and sprinkled with some absorbent powder, such as starch or violet powder.

Electrization of Internal Organs.—The rectum and muscles of the anus may be electrized by introducing into the rectum the rectal rheophore, a metallic stem insulated by gum elastic, and moving it over the internal surface, bringing it also into contact with the levator and sphincter ani. A well-moistened sponge connected with the other pole may be applied to the abdominal muscles or to the neighborhood of the anus. The rectum must be first freed from fecal matter.

The bladder is most readily electrized by the introduction into the rectum of the rectal rheophore, and into the bladder—previously emptied—of a curved metallic sound insulated by an elastic catheter to within an inch of its vesical extremity. This sound must be brought into contact successively with all points of the neck of the bladder.

The uterus may be electrized by the introduction of the rectal rheophore, connected with one pole, to the os uteri, and by the application of two sponges from the other pole, one to the abdominal parietes, the other to the lumbar region.

The larynx may be electrized externally by one sponge to the nape of the neck, and the second to the exterior of the larynx; or, internally, a sponge to the neck as before, and the introduction by the aid of the laryngoscope of a small bit of sponge at the end of a curved metallic stem, insulated by a gum elastic catheter, the current not being allowed to pass until it is seen by the laryngeal mirror that the sponge is in the desired position.

The male genital organs may be electrized by moist rheophores to the scrotum over the testicle.

Electrization of the Organs of the Senses.—The retina may be electrized by a moistened conductor to the closed eye, and the second to the temple or to the mastoid process of the same side. The auditory nerve by one conductor tipped with sponge, and inserted to the bottom of the meatus, the second being held in the hand of the opposite side; or the meatus may be filled with tepid water, and a metallic wire traversing the axis of a vulcanite tube may be immersed in the water, the second conductor being a well-moistened sponge to the nape of the neck. The olfactory nerve by sponge to neck, and movement over all points of the nasal mucous membrane of a metallic sound, insulated except at its extremity. The nerves of taste by sponge to the neck, and movement of the second conductor over the base and borders of the tongue.

Electro-diagnosis.—Electricity will assist us only in those conditions in which there is altered muscular contractility, or cutaneous or muscular sensibility, or both.

Healthy nerves and muscles respond to the electric stimulus whatever variety of electricity is employed; but in disease this reaction may be increased or diminished, or altogether absent. The irritability of a muscle is tested by ascertaining the lowest power which will cause its contraction. Supposing the case to be one of hemiplegia, say of the left side, having found the lowest power causing contraction of any one of the healthy muscles of the right side, we apply that same power to *identical points* of the corresponding muscle of the diseased side, and note whether there is contraction. If there is, we decrease the power of the current, and if contraction still occurs there is increased irritability, and *vice versa*. It is essential that on both sides there should be exact similarity in the application; and this is especially important with the voltaic current, for healthy muscles and nerves answer more readily to it when it flows down the limb—*i. e.*, with positive pole above and negative below—than when it flows up, and consequently a reversal of the poles will influence the result. In testing a case cf paraplegia where there is equal disease on both sides, we must be guided by a knowledge of the strength of current usually required to bring about contraction.

In a case of hemiplegia it will be found almost invariably that irritability to both varieties of electricity is normal in the muscles. This proves the integrity of the muscular tissue—if the muscle also responds to indirect excitation by its motor nerve, we know, in addition, that the conducting power of the nerve is uninjured, and that the spinal cord has preserved its integrity at the spot where the nerve is given off. The disease is in the brain. If we find irritability diminished—more than that slight diminution from disuse which is restored by two or three

faradizations—there is disease of cord, or nerve, or muscular tissue, and the disease, as a rule, will be in direct proportion to the amount of diminished irritability. The reaction to the interrupted voltaic current will generally correspond to that to faradism; but in some cases in which response to faradism is abolished, the reaction to a slowly interrupted voltaic current is not only preserved, but greatly increased. In these cases the nerve will react to neither current; and the increased irritability is due to the muscular tissue, *without the agency of nerve*, and it exists only in peripheral and never in central lesion.

By this differential reaction we may diagnose peripheral from central paralysis; for example, paralysis of the facial nerve from facial hemiplegia, paralysis of the extensors of the wrist and fingers, due to lead poisoning, from commencing muscular atrophy, or from rheumatic paralysis, progressive muscular atrophy from paralysis from section of a nerve, essential infantile paralysis from other varieties of paralysis—all important questions as affecting treatment.

In paralysis from disease of the cord there is almost invariably diminution of reaction in the affected muscles to all varieties of electricity, and the possession of normal irritability will often help us in the diagnosis of cases of emotional paraplegia. The condition of muscular irritability will largely aid us to distinguish between real and pretended disease; and finally, its entire abolition in all the muscles of the body, is conclusive proof of death.

Increased irritability points to increased vascularity, irritative lesion of brain or cord, or both, but in such cases we seldom require the aid of electricity to complete our diagnosis.

Electro-therapeutics.—I propose to refer very briefly to the general principles regulating the application of elec-

tricity in medicine, and to instance a few of the special forms of disease in which its administration would seem to be imperatively demanded.

The *influence of faradism* in those cases in which it does not produce muscular contraction, is chiefly stimulant; where it does produce contraction it acts in addition as an artificial gymnast, imitating natural muscular action in a way quite impossible to any agency but electricity. It is in cases where there is muscular response to it, but not to the will, that faradism is often of immense service, and it can then be replaced by no other remedy known to medicine. In these cases, too, its dosage is important, that the weakened muscles may not be exhausted.

The *interrupted voltaic current* is similar in its action upon muscle to faradism, but this is complicated by chemical and electrolytic effects upon the animal tissues, and by certain special influences upon the central nervous system. It is of great value in the treatment of those cases of loss of power in which the paralyzed muscles, whose response to faradism is wholly lost, contract under the influence of a slowly interrupted voltaic current.

The Constant Voltaic Current, the "*Constant Current*" of which we have all heard so much, differs *toto cœlo* from the above, for it consists not of *any* voltaic current from *any* voltaic battery, but of a current from that form of battery which supplies one, not only continuous but one which does not vary appreciably in power during the application; and not only so, but of this current so applied to the patient by the operator, that its flow through that part of the patient's body to which it is directed shall be as continuous as the stream of the current from the battery to the conductors. Unless thus applied, it is not a constant current, and its therapeutic

application will be unsatisfactory. The effects of the constant current thus applied are chiefly sedative, restorative, or refreshing, and absorbent or resolvent. It has great power in relieving pain, and it is sometimes unapproached in this power by any other remedy. None of its therapeutic results is more firmly established; and were it in no other respect of use, its services here would entitle it to the foremost rank as a remedy.

a. For Relief of Pain.—It is of the greatest benefit in neuralgia. The sponges should be so applied as to include the affected nerve in their circuit; the number of cells should be the highest number that the patient can bear without pain, and care should be taken not only to maintain the conductors quite immovable upon the body, but to avoid shock by abruptly shutting the electricity off or on; two cells should be commenced with, and the current so gradually increased, that no shock is felt, and at the end of the application it must be as gradually decreased, for it must be remembered that an abrupt removal of the sponges would give a shock. The length of application from five to ten minutes, and the frequency usually once or twice daily; but I have met with the best results in obstinate cases by applying the current as frequently as the paroxysms of pain recurred. Dr. Althaus considers that the positive pole should always be applied to the seat of pain; the negative pole is more irritating than the positive, and on this account the latter is better borne. It is, however, the constancy of the application that is of primary importance. I generally place the negative pole with a large sponge upon the spine over the origin of the nerve affected, and apply the positive pole to the painful spot; and if there are more spots than one, to them all in succession. It is seldom that relief is not afforded, even if cure do not result. The number of cells must

be determined according to the region affected. In the face, about five to ten will generally be sufficient; and the application must be discontinued upon the occurrence of the slightest giddiness.

b. Galvanization of the Cerebral Hemispheres is very beneficial in true migraine (sick headache), two to three cells to each temple, or to each mastoid process.

c. In Angina Pectoris, one pole to spine, and the other to the region of the heart. Dr. Anstie and Dr. Russell Reynolds both quote successful cases.

d. The Pains of Muscular Rheumatism may almost invariably be removed or mitigated by cutaneous faradization, and so rapidly, as in many cases to appear marvellous. The current should be strictly limited to the skin.

e. In Rheumatic Gout, the voltaic current has been found of the greatest use by Althaus. He directs the positive pole to the cervical spine, and the negative to the pit of stomach, the sponges being of large size, and a mild current allowed to flow for from three to five minutes. This frequently causes sleep. Pain may be relieved by a small conductor from the positive pole to the painful spot, the negative with a large sponge being held in the neighborhood. Length of application, one to five minutes.

f. In Cerebral Paralysis.—It is probable that in some cases of cerebral paralysis, where the clot or softening is of limited extent, the process of reparation in the brain may be promoted by the use of the constant current; *but too much caution cannot be exercised in its application.* Peripheral faradization is seldom advisable until some three or four months after the attack. Faradization should then be used of a strength just sufficient to bring the muscles into full contraction. In those cases in which the paralyzed muscles are cold, blue, flaccid, and ill-nourished, and where a generally anæmic type predominates,

the muscles should be well sponged with the voltaic current (the positive pole being held stationary upon the origin of the muscle, and the negative being evenly "painted" as it were over its entire surface), alternately with faradization. Applications to be made daily, or every other day, for from five minutes to fifteen minutes.

g. Spinal Paralysis.—In *spinal paralysis*, we must be guided by a consideration of the nature of the disease, and the condition of the cord, muscles, and nerves. The evidence of the good resulting from central electrization of the cord is much greater than can be adduced in support of similar treatment of the brain. Such applications, when powerless to cure, not unfrequently relieve some of the most distressing symptoms.

Peripheral faradization must not be employed during the early period of active mischief in the cord; but in the persisting localized paralysis following upon myelitis it is often of the greatest service, especially in relieving symptoms of paralysis of the bladder and rectum.

The dribbling of urine, which is so troublesome in some paraplegic cases, may be frequently relieved, and the condition of the sufferer made much more tolerable. The interrupted voltaic current should always be given a trial where faradization fails—one pole to the lumbar spine, and the other to the pubes; length of application about five minutes; interruptions three or four times a minute. Application, twice daily.

In traumatic paralysis, in local palsies, such as mercurial and lead palsy, in all peripheral palsies, and notably in facial paralysis, in rheumatic and in all forms of atrophic paralysis, and in some varieties of ocular paralysis, some one or other of the different forms of electricity will be essential to the most successful treatment.

Central applications of the voltaic current must be made

according to therapeutic requirements, and the methods already described; but the general rule, applicable to all localized muscular electrization, is to test the muscles with the faradic and the interrupted voltaic current, and to electrize them with that current to which they most readily respond.

h. Locomotor Ataxy.—In locomotor ataxy, the constant current applied to the spine has, in one case under my care, resulted in perfect recovery, and in many others it has relieved many of the symptoms. In the case referred to, the ataxy had existed for eighteen months, the gait being most characteristic, and the patient unable to walk without assistance. There was also considerable anæsthesia. The current from fifteen to twenty cells was applied to the spine by large sponges (the sponge-holders being five inches in diameter), the positive sponge to the nape of the neck, and the negative sponge to the lower lumbar vertebræ, both sponges held immovable, for ten minutes upon going to bed and getting up in the morning, followed by five minutes' faradization to the legs and feet with the wire brush. The patient had improved in one month, could walk without assistance in three, and was apparently quite well in eight.

i. Spasmodic Diseases.—In spasmodic diseases, electricity should always be given a trial. In *writer's cramp*, which consists essentially of a paroxysm of spasm whenever the sufferer is called upon to execute some special movement, but in which there is no true paralysis, Dr. Poore has very successfully applied the refreshing and restorative effects of the voltaic current, by localizing it in the nerves of the affected muscles, and exercising these muscles *during the passage of the current*, by various gymnastic movements. I have been successful in two cases by faradization of the antagonists of the suffering muscles,

united with the localization in the muscles themselves of "Radcliffe's Positive Charge" for fifteen minutes daily; and similar treatment was most beneficial in a case of *torticollis* in a young lady twenty years of age. In her case, the spasm was almost constant, had existed for twelve months, and had resisted every kind of treatment, including hypodermic injections of morphia, and the wearing of a mechanical apparatus. There was some wasting of the sterno-mastoid and trapezius on the right side, and the corresponding muscles of the left side exhibited increased irritability to all forms of electricity, and were the seat of pain and wellnigh constant clonic spasm. The voltaic current from fifteen cells was localized in these muscles, by stationary sponges, for fifteen minutes night and morning, and at the same time the antagonist muscles were well faradized.

j. Infantile Paralysis.—In "*essential infantile paralysis*," the physiological treatment of the affected muscles should become the routine treatment invariably directed by the practitioner, and that within a week of the outset of the disease. In infantile paralysis premonitory symptoms are often absent or but slight, and not seldom the child is put to bed well, and found in the morning to have lost the use of one or more of its limbs; but the visceral muscles are never affected, and the paralysis is motor only, sensation being unaltered. The paralyzed muscles soon suffer in their nutrition, the limb affected is found to be much colder than its fellow; and, tested by electricity, there is complete abolition of farado-contractility, but marked increase to the interrupted voltaic current. If proper treatment is adopted *in time*, and before muscular degeneration and atrophy have advanced too far, the greater number of cases of infantile paralysis admit of cure. The case must be

treated, at first, upon general principles, but localized treatment should be had recourse to as soon as possible, and *before the muscles themselves begin to atrophy, or to be impaired in their nutrition.* The reaction to electricity of the weakened muscles should be tested, and each muscle should be daily electrized for a few minutes with that current to which it responds, and of a strength just sufficient to produce muscular contraction. If the precaution is taken of commencing with only moistened sponges (no current being allowed to pass), and then gradually inuring them to the strange sensation, children betray, as a rule, but slight signs of pain, and I have even seen the operation amuse them. In addition to electrization, the paralyzed limbs should be immersed in water, as hot as can be borne, for a quarter of an hour twice a day, and should afterwards be well rubbed and shampooed; or they may be sponged in very hot water, and then shampooed. In the intervals of treatment the temperature of the affected muscles should be maintained at as high a degree as possible; and if the leg is affected, a stocking of pure silk should be constantly worn, day and night, in addition to the ordinary clothing; if the arm, a silken sleeve; or, if necessary, ordinary chamois leather, as a cheap substitute for silk, one for day and one for night wear. When *any* amount of voluntary power has been restored by electricity, the child must be encouraged to use the limb, and practise various movements. Passive movements are of equal importance; and the mother or nurse must be taught to frequently exercise the paralyzed muscles to the fullest extent of their normal movements—*e. g.*, if the extensors of the hand and fingers are paralyzed, the hand and fingers should be flexed and extended completely by the nurse at intervals of a few seconds, for some minutes, and so on with all the paralyzed muscles in succes-

sion. If the above directions are patiently and faithfully carried out, there are very few cases, indeed, if there be any, in which we need fear deformity, and this never until the child begins to walk. If, however, we then observe distortion commencing, the weakened muscles will require mechanical support; but great care must be taken that this support *is in no wise allowed to supersede the healthy exercise of the muscles.*

Essential infantile paralysis is always a tedious disease, and it is unfortunate that it is generally when all kinds of treatment have been vainly exhausted that electricity is appealed to as a forlorn hope. In these chronic cases, a satisfactory result can only be expected after long perseverance; but there appears to be scarcely any limit to the time in which even complete recovery is possible, provided that the paralyzed muscles retain their electro-contractility, and so show that they have not degenerated.

The question arises, *How far is it advisable for the medical practitioner who prescribes electricity to sanction its administration by the patients themselves?* The most explicit directions will often be misunderstood, or fail in being correctly carried out; and yet we are compelled, in certain cases, to do our best in instructing *some one attendant of the patient* how to carry out the treatment, making her do this a few times in our presence, *and looking sharply after her afterwards*, and, in addition, explaining everything as fully as possible to her mistress. Moreover, we must not lose sight of the fact that, with electricity as with other remedies, the skill of the physician is shown in determining how, when, and in what dose to administer it, and his judgment in selecting those cases in which its administration may be wisely committed to others.

Electricity in Surgery.—Surgery also owes much to electricity, for in addition to its indebtedness for the galvanic

cautery, the dispersion of tumors by the electrolytic or chemical action of electricity is making daily progress, and will probably before very long become a recognized part of ordinary therapeutics. The galvanic cautery is an application of the power possessed by the voltaic current of raising a conducting wire to a red or white heat. For this purpose, ordinary medical batteries are altogether useless, special batteries possessing elements of large surface being required.

Electrolysis.—In electrolysis medical batteries are used, and it is chiefly applicable to tumors or growths which from their nature or situation are difficult or impossible to be removed by the knife. One or more needles connected with a voltaic battery in action are inserted into the tumor, and it is subjected to the disintegrating influence of the current of electricity. There is no hemorrhage, and after the dispersion of small tumors there is frequently no visible scar. The number of needles must of course vary with the size of the tumor; for a very small one, one needle is sufficient, but for a growth of say an inch in breadth, two or three will be required; and in subcutaneous tumors, where it is desired to avoid injury to the skin, the needles should be insulated by gum elastic, or vulcanite, to within a quarter of an inch of their points. Local anæsthesia of some kind will usually be required; and it may often be sufficiently produced by painting the part with a mixture of one part of carbolic acid to two parts of sulphuric ether. The pain and the *fear* of the operation will thus be reduced to a minimum. Where only one needle is used, it is generally better to connect it with the negative pole, a large sponge from the positive pole being applied in the neighborhood of the tumor. Where more needles than one are inserted, they should be connected with both

poles. These are the most generally useful needles, and holders with eyelet holes may be made for the attachment of conducting wires which render the operator independent of special conducting cords, for with a coil of insulated wire and a pocket knife he can fit up his needles in a few minutes in any way best adapted to his proposed operation.

a. Electrolysis has been successfully employed in several cases of *aneurism*. Where pressure and ligature admit of application, it is hardly necessary to say that the preference should be given to them; but many internal aneurisms, and especially aortic aneurisms, cannot be thus treated, and in such cases the question of electro-puncture should be carefully considered, and, when called for, it should not be too long delayed. Two fine, sharp, and carefully insulated needles, one connected with each pole, should be introduced into the aneurismal sac, and the current allowed to pass for from half an hour to an hour, the needles carefully withdrawn, and their punctures covered with a bit of lint soaked in collodion or styptic colloid. Authorities are divided as to the kinds of aneurism calculated for electro-puncture, but there is no doubt that an aneurism pressing on the parietes, but not having actually perforated them, is the best adapted for this treatment, and that it is contra-indicated where the sac is of large size, or where large trunks issue from it.

b. The treatment of *malignant tumors* by electrolysis is yet *sub judice*, but the evidence in its favor has recently much accumulated. If future experience should demonstrate that localization of the galvanic current exerts a more powerful destroying or retarding influence upon disease germs than local treatment by caustics, a much more hopeful future will be afforded to sufferers from malignant disease.

HOW TO APPLY TRUSSES IN HERNIÆ.[1]

Hernia may be treated with a great amount of success by proper care and mechanical restraint. We will first consider what may be accomplished in inguinal hernia by trusses in the way of cure, the kind of truss to be applied, and the sort of apparatus which is either of no use or positively injurious, and therefore to be avoided.

I. Inguinal Hernia.

The Pad.—There are two parts of the truss for separate consideration. The chief and most important part is *the pad.* All trusses for reducible hernia are provided with some sort of pad, whatever may be their principle of mechanical action. The object of this pad is to press upon the opening through which the rupture passes, to keep the bowel or omentum from getting into the canal, and, if possible, to prevent it from slipping down into the scrotum, even if it passes the internal or deep abdominal ring.

Objections to Conical Pads.—Some shapes of pads are very objectionable in principle. One, for example, is so conical as to be almost bluntly pointed. Put this on a weak place, and what ensues? There is a hole beneath the integuments, which are spread over that hole, covering it in. The conical or acute truss-pad presses these superficial tissues into the hole, in much the same way as when you put a cork into a bottle, with a piece of leather over it. It thus spreads the tissues out, stretches and weakens them, and, at the same time, dilates the tendinous aperture of the superficial ring. The injurious effect of wearing continuously trusses of this kind, or their various

[1] Condensed from Clinical Lecture by John Wood, F.R.C.S., etc., Prof. of Clinical Surgery at King's College, London.

modifications, all of which have the same radical vice, is increased in some by a powerful spiral spring placed inside the conical pad, so that they press the tissues still more powerfully into the hernial opening. The movements of a patient who wears such a truss cause a constant working of this spring, and a boring motion into the aperture is produced, like the twisting of a cork into the neck of a bottle. Moreover, in a case of rupture you have, not a resisting bottle-neck, but an elastic and valvular opening, which yields to the pressure. You are continually obliged, therefore, to increase the size of your cork-like pad, so as to fully occupy the hole, and sustain the rupture. The aperture regularly increases, and the rupture, when it does come down, constantly becomes larger, and more liable to become scrotal, until at length it gets so large and unmanageable that no truss will keep it up.

It has been asserted that, as a fact, the projecting conical pad only buries itself in the subcutaneous tissues, and does not project between the pillars of the ring. But this seems a purely arbitrary assumption, and one certainly contrary to the results of observation in cases which have been subject to such pressure for a length of time. If there be no pressure exerted by the point of the cone, what effect can it have in restraining the rupture at all? If it has any effect at all upon the inguinal canal, that effect must be in accordance with the shape of the impinging surface. A conical wedge-like pressure cannot be transformed into a flat pressure by skin and fat, which are almost as yielding as water. And what occurs in the numerous cases in which the skin is thin and delicate, and the fat almost entirely absent? A rounded surface must press on all sides in a direction perpendicular to the surface which presses. It must tend, therefore, to thrust

outwards the pillars of the ring, and to stretch and weaken the intercolumnar fascia, as verified by a post-mortem examination in numerous cases where a truss had been worn. In fact, a conical surface fitting into a slippery and elastic opening, rather favors the escape of the hernia between its sloping sides and the edges of the aperture, as soon as the rupture acquires sufficient power to lift up the truss-pad a little; and if it becomes displaced laterally, the hernia immediately slips down the inclined plane. Sometimes in such a case the instrument maker, finding the rupture to slip down into the canal, and wishing to stop it in its descent, prolongs his truss-pad downward into a sort of tail, and makes it bigger and bigger, until at length he pushes aside the scrotum, and may bring the pad down into the perineum. Such arrangements are exceedingly uncomfortable to the patient, and if a rupture gets down the canal so far as to need such a secondary pad, it is certain to pass on into the scrotum; you cannot stop it. The most important indication, therefore, is to prevent the rupture from entering the canal at all; to shut up the internal ring altogether.

Best Forms of Pad.—The pads are fastened on to the retaining apparatus in a variety of ways. Some are made so as to be adjusting, with the idea of following the rupture in the various twistings of its course and emergence. After long experience, I have come to the conclusion that nothing useful can be done by such pads as these, unless the patient is constantly on the watch to adapt the pad to the shiftings of the rupture. This, I need not remark, can scarcely be done in society, or in the streets, or in various situations where the stress of a rupture may come. The best way is to have your pad so fixed that it prevents the rupture from getting into the canal at all. The kind of pad I myself recommend—what I chiefly insist

upon—is, first, that the bearing of the surface of the pad shall be *flat*, that it shall not press in the tissues or invaginate them into the canal between the pillars of the external abdominal ring, and thus stretch, fray, and weaken the intercolumnar fascia which ought to restrain the rupture from coming down. The edge, of course, must be rounded off to prevent it cutting. We get, therefore, to this kind of flat-bottomed-boat shape according in outline with that of the inguinal canal in its diseased condition; that is an oblique oval. In oblique inguinal hernia in the female a flat oval pad, without any break in its outline, answers very well indeed. In the male, however, there is a peculiarity in the anatomical arrangement of the parts. The spermatic cord passes out of the superficial abdominal opening external to the spine of the pubis, crossing or lying over the outer pillar of the ring. If the truss-pad produces a pressure upon the cord, it not only makes the patient uncomfortable and the pad more liable to shift and slip about, but also may cause swelling of the testicle, hydrocele, varicocele, and ultimately atrophy; while the chafing of the pad against the pubis leads to the formation of excoriations, sores, and even abscesses. In order to avoid this, we make in the truss a chink or slit in the pad. This gives the pad a sort of oblique horseshoe shape. If properly put on, the shorter end lies upon Poupart's ligament immediately outside and above the spine of the pubis; the longer end lies on the inner pillar, and the round end covers the deep hernial opening of the external ring. The cord, being very movable, will adjust itself to the pad and slip into the part where there is the least pressure, *i. e.*, into the chink left between the two points of the pad.

If you hope to get the inguinal canal closed up, and the sac obliterated by a radical cure, it is better to have

the pressure hard and firm; and the best material for the pad is the substance called "vulcanite;" it does not absorb the perspiration, is perfectly smooth and hard, and, if proper care is taken to keep the surface clean and dry, will not chafe or give rise to sores. The next best substances are boxwood and ivory, which however, absorb the perspiration to a somewhat greater extent. Experience of these trusses in hot climates has been unanimously in favor of the hard vulcanite over any other substance for truss pads. Leathern or parchment coverings become putrid, foul, and hard, under the effect of constant absorption of cutaneous excretions, and get so nasty that sensitive and cleanly patients cannot bear to wear them. In other cases, where you do not go into a radical cure so much as for making a patient comfortable, then water and air pads, made up of india-rubber upon a metal frame, are exceedingly comfortable and useful. Some patients cannot bear any other than this soft pressure. They are of the same general shape and principle, but the surface is more yielding, and the pressure is soft; they cannot press into the hernial apertures as hard conical pads do, and the pressure, being fluid, is equal in all directions.

Retaining Apparatus.—The nature of the apparatus for fixing and keeping on the pad and restraining the rupture is also of great importance. The rupture requires pressure to retain it, and, as a rule, you do no good at all unless there is a side-spring. There have been various ways devised of applying this retaining apparatus. One way which the patients sometimes choose, and which seems to recommend itself to them by its simplicity, is having a strap round the body, and an understrap across the perineum. Now it is exceedingly difficult to wear a band round the waist so tight as not to give way to pres-

sure at one point, and so to yield before the rupture. Even if you could make it tight enough, the patient could not wear it, the tightness would be so great. You may take it, as a rule, that these straps round the pelvis, when a patient is exerting himself and contracting his abdominal muscles, are of no use in keeping in a rupture. Where there is real need of pressure, nearly all truss-makers have recourse to some form of the side-spring. Some have the spring passing only round one-half of the body, with a pad behind, on the sacrum. This pad is always flat or oval, and slightly concave, and is larger and thinner than that placed on the rupture. It is held in its place by a strap that goes round the opposite side of the body, and frequently by an understrap across the perineum. Some have the spring put on the same side as the rupture; but in one of the best forms the spring is put on the opposite side, so that it reaches across the front of the abdomen, and is longer than those which are put on the same side as the rupture. The rupture pad projects more than the posterior one, and works upon a ball-and-socket joint. The spring is longer than is necessary to go only half round the body; it reaches over to the opposite side, and the support it gives depends upon the fact of its pushing upwards and towards the ruptured side. Other half-round springs depend upon the power they possess of pressing or pulling upwards and outwards towards the same side, in opposition to the descent of the rupture. Sometimes it is necessary to wear a perineal band which buttons in front. Generally speaking, this may be dispensed with after the truss has accommodated itself to the shape of the body, which, after a time, all trusses do to some extent. The warmth and motion of the body will make even the spring accommodate itself somewhat to the shape of the body.

The Spring.—With regard to the bend of the spring, there are one or two matters of very great importance. In the first place, the spring should go round the body at a level midway between the projection of the trochanter and the anterior superior iliac spine. There it lies on the tensor vaginæ femoris and gluteal muscles, and does not work over bony surfaces. That is the level at which the measurement for a strap should be taken when you have to send for a truss to a maker. But I may here remark that it is never satisfactory to send measurements without the maker seeing the patient.

The maker wants, in addition, to comprehend the shape of the back and set on of the pelvis as well as the mere dimensions. So that, if possible, you ought to bring the maker and patient together. Other plans do not usually succeed. The spring should point down far enough to get to the opening, and the pad should be placed upon the opening. The spring requires to be bent down a good deal more for crural than for inguinal hernia. For crural hernia the side-spring should be made like the handle of an old-fashioned pistol. That end of the spring which bears the pad should project well, so as to give a proper degree of backward pressure; and if you look at the surface of the spring you will see that it is somewhat twisted on its own axis, so as to give an outward and upward pressure as well as a backward pressure. This gives the right direction in which to keep the hernia in the abdomen when it tends to pass into the canal. The round part of the horse-shoe pad presses upon the internal ring, and the ends press upon the pillar of the external ring. The chink is to lodge the cord, which is thus held as if embraced by the fingers employed in reducing and keeping in the rupture. Thus the rupture is prevented from coming through the internal ring, while the pillars of the

superficial opening are prevented from separating, and so allowing the rupture to pass out.

The length of the spring from the point where it comes round the hips should be duly proportioned to the patient's formation. In these horseshoe pads there are holes and screws by which the pad can be shifted a little to adjust this properly. If the spring be too long at this part the pad presses against the outer edge of the rectus muscle. The inner border of the pad should be parallel to the outer border of this muscle, and the outer border should lie upon Poupart's ligament. If the spring be too long it pushes the pad further on to the muscle which bears off the pressure from the hernial cause during the contraction of the muscle, permitting the rupture to escape below and outside the pad. If, on the other hand, you have the spring too short, the rupture will escape between the rectus and the pad.

II. Direct Inguinal Hernia.—A direct inguinal hernia passes through the triangle of Hesselbach, inclosed between the epigastric artery, the edge of the rectus, and Poupart's ligament. That is the area you have to protect; and it can best be done by a flat-rounded or oblately-oval pad fitting close between the edges of the rectus and Poupart's ligament, reaching well down to the crest of the pubis, and provided with a slight notch below for the passage of the cord. To keep the pad from shifting upwards, and from pressing unduly upon the pubis, care is required in adjusting the action of the side-spring. It is as well to wear at first an under or perineal strap, until the pad and spring have adjusted themselves to the shape of the abdomen. In corpulent persons a considerable upward slope may be also given to the surface of the pad, to make it lie parallel with the slope of the abdomen, and to prevent the upper edge from

pressing unduly into the flesh. In thin persons, with lean flanks, the tendency is always for the pad to slide upwards into the hollow formed by the abdomen. This can be met sometimes by keeping the surface of the pad quite flat, so as to lie perfectly level upon the surface of the groin. You may, however, in the course of time, in the same patient find a marked alteration in the slope of the abdomen from an increase in the abdominal volume, as well as in the thickness of the superficial fat, altering entirely the conditions of the rupture and the requirements of the pad and spring. In some instances this may occur in a very short time. On the other hand, a patient, from illness or active work, may get rapidly thin, and require a readjustment from this cause. To meet and manage these conditions, is one of the niceties of truss-making. It is sometimes difficult to get the exact twist, and even when you have got it right, the condition of the patient may change, and you may have to alter the spring accordingly.

The problem to solve may be put geometrically; it is requisite to obtain the angle of inclination of the abdomen to a transverse vertical plane, taken at the most prominent part of the inguinal region, and containing the side of a right-angled triangle of which the posterior wall of the inguinal canal is the hypothenuse, and the horizontal level of the upper margin of the pubis is the base. If you do not have the pad-surface inclined enough, the rupture comes down under its lower border, and if you twist it too much, you get the same edge pressing in so as to inconvenience the patient, and allow the rupture to enter the upper part of the canal. It is this slipping over and under on one side or the other that constitutes the troublesome part of the treatment of ruptures by trusses. You do not often find patients who have suffi-

cient mechanical knowledge, or who take sufficient pains, to aid the efforts of the instrument-maker by skilful adjustment of the pad after a careful return of the rupture. This is one cause why so few cures are effected in this way. I recommend, as a rule, the all-round spring covering over both hips, instead of the one-sided spring; but in certain cases half-round spring, fitted to the opposite side of the hips, and pushing towards the ruptured part, may be advantageous; the horseshoe form of pad, however, may be used quite as well with this form of spring.

Irreducible Hernia.—In old cases of irreducible hernia you meet with another difficulty; you cannot reduce the hernia entirely, and all you can do is to prevent more of the intestines from coming down. In such cases the bowel may be exposed to all sorts of injury, besides constituting a deformity of a somewhat conspicuous character. To remedy this you must have a suspensory or bag truss made of stout jean, or some unyielding material, which will keep a constant pressure upon the contents. If the irreducible portion consist of omentum only, you must also have some pressure over the inguinal canal to prevent the bowel from following the omentum. Such combinations are sometimes exceedingly difficult to carry out. In a case of this kind one of the best arrangements is a truss-pad shaped to the form of the rupture, composed of a frame of stout wire, well padded, and stretching between the wire framework a bag of stout jean, or of some slightly-elastic material, sufficiently resisting, into which the hernia is received. The wire framework, pressing all round the irreducible rupture, keeps it well in hand and under control. All you can do in such cases is simply to make your patient as comfortable as circumstances will allow, and to prevent injury to the irreducible rupture.

III. Crural Hernia.—In crural hernia we have conditions entirely different. The inner opening is constituted by the crural ring, a horizontal aperture with a slight inclination forward. In front it is bounded by Poupart's ligament, on the inner side by Gimbernat's ligament, and on the outer side by the femoral vein and artery. These are structures which vary somewhat in tension. Relaxation of the muscles of the abdomen has a great effect upon Poupart's ligament. But the greater part of the surrounding structures are composed of unyielding ligamentous tissue, so that there is not that contraction and relaxation that is present in inguinal hernia. A little below there is another opening, called the saphenous opening, directed forwards, and a little inwards, and almost vertically, but with a slight inclination downward. Lying in front of the passage between these two openings is the upper part of the process of Burns's or femoral ligament (Hey's), which extends from half to three-quarters of an inch downwards from Poupart's ligament, with which it is continuous above, to the margin of the saphenous opening.

It is this part to which the pressure of a truss should be applied in crural rupture, when it will protect both crural ring or upper, and the saphenous opening or lower, aperture of the crural canal. Immediately outside the canal are the femoral vein and artery, which must not be pressed on by the truss, and below is the saphena vein, which it is also important not to compress.

When a femoral rupture gets fairly through the saphenous opening, it turns upward and outward round the edge of the falciform process, and lies over the femoral vessels and upon Poupart's ligament. In order effectively to deal with this rupture, you must altogether prevent it coming through the crural ring into the canal before it

makes the upward and outward turn, so as to lie upon Poupart's ligament. If you fail in this, then your truss pressing the rupture against the falciform process of Burns thereby injures the bowel, and does harm rather than good, and the patient would be safer and better without a truss at all.

The truss-pad for crural hernia must protect the crural ring by pressure over Poupart's ligament, and it must also press upon and fill the saphenous opening. It must not press downward, so as to obstruct the saphenous vein. The pad will be apt to slip, so as to miss the crural canal altogether, and, by irritating the inguinal glands, may cause trouble. The best form of truss-pad for this hernia is one which I may thus describe: The outline is an egg-shape, with the small end downwards; it is adapted to the saphenous opening, but rather longer, so as to press upon Poupart's ligament with its broad end above, and the side-spring is fixed exactly in the centre. It slopes off below, so as to avoid pressing upon the saphenous vein, and forms a rounded projection above, so as to fall into the fold of the groin upon Poupart's ligament when the patient sits down. It is thus adapted for keeping in position; for the truss-pad which most adapts itself to the form of the surface will stop in its place the best.

In the truss for femoral hernia, the pad end of the spring is bent downwards in a large curve to permit the patient's thigh to bend freely and without obstruction in sitting. You ought not to be content with seeing your patient stand when you fit on a truss; you must make him sit down on a low seat, and then stand, walk about, and jump from a stool, and see if that dislodges the truss. If the truss does not hurt him, but keeps the hernia up, under those conditions, you may conclude it will do for

all the ordinary purposes of life. The commencement of a radical cure by truss pressure always dates from the last time the bowel or omentum came into the sac of a rupture. Hence the importance of the patient preventing the hernia from ever coming down. If it come down even once, he has to begin *de novo* from that point to produce the obliteration of the canal. Hence a patient who wishes to get rid, at the earliest possible period, of a disagreeable and troublesome deformity, must wear his truss on all occasions, night and day; he must never assume the erect posture without it; and if he bathes, he must have a bathing truss, for sometimes in the gymnastic movements which generally attend upon a cold bath the rupture may come down.

IV. Umbilical Hernia.—Umbilical rupture is exceedingly common in children, and in them it is usually curable. It comes through a natural opening which is left for the umbilical vessels up to the time of birth, and which it is the tendency of nature to close up sooner or later. That tendency is very strong, and the only thing that prevents it is the bowel constantly coming into the sac. If you can, in a child, manage to prevent this, you cure the hernia; and that is generally the case when the improved apparatus of the present day is carefully attended to. But there are some cases where the child is not tractable, and from pain and fretfulness is often crying and screaming; then you get the rupture distended violently and constantly. Again, if the nurse is not soothing and careful you seldom get the rupture cured. The ordinary rough-and-ready and often very successful fashion of treating umbilical hernia is covering a flat piece of metal, say, one of the old-fashioned copper coins, a penny-piece, with plaster, with the sticky side outwards, putting it on the projection, and strapping it across the abdomen with broad straps of adhesive plaster.

In some of the older books on this subject you will find recommended a convex cork plugging up the aperture, like the neck of a bottle; but elastic apertures of vital tissue cannot be blocked up in that way, while the cork tends to make matters worse by dilating the aperture, and thus keeping open the rupture. Therefore that is one of the things to be avoided. It does not keep in the rupture, because it will slip out at the side of the cork. A flat surface, rather larger than the aperture, is what you ought to have. A flat penny-piece, or bit of lead of the same shape and size, may be backed up by a thicker piece of wood or cork, and the strapping may be put across. In this way a very good and easy apparatus is made, if the patient cannot afford to have a proper apparatus; but it involves the necessity of a tedious process of taking off sticking plaster, which is sometimes not done in the gentlest way, and thus sets up a crying bout, and brings the bowel out of the aperture. All this is inconvenient. When you are called upon to do this, you must press the parietes of the abdomen together with your finger and thumb, so as to close the umbilical hole before you take off the pad and strapping, and take care the bowel does not slip out.

A capital invention is a very ingenious adaptation of elastic India-rubber, arranged in two compartments, distended with air, and communicating by a small aperture; a central one, globular in shape, and an outer ring. The former presses upon the umbilical opening, and the outer upon neighboring tissues forming its boundaries, and so prevents the umbilical hernia from coming out under a cough or cry impulse. This central portion acts like the penny-piece, with the additional advantage of becoming tightly distended by the air from the surrounding ring cushion forced through the small aperture of communi-

cation by the impulse of the abdominal muscles. The whole is held on by an elastic band round the body, and can be distended after fixing by blowing through a little stop-tap. By this means, the moment the bowel has a tendency to escape through the hernial aperture, it is met and forced back again by the dilating globe. By this means some very capital cures may be produced in children. In adults, also, in whom it is much more difficult to produce a radical cure, this apparatus is very useful and comfortable. The chief reason why in adults you do not get a radical cure of umbilical hernia is because it is generally accompanied by abdominal obesity and laxity, the stomach too becoming at intervals much distended with food and flatulence, and the mesenteries being enlarged by an accumulation of fat. In such persons you must be content, even in any kind of hernia, with amelioration of their condition rather than cure. But in young persons you may frequently succeed in effecting a cure by the aid of a proper instrument. If, in young persons, a hernia of the inguinal or umbilical variety resists the cure by careful mechanical restraint, then it becomes a question whether you cannot safely and greatly increase the chance of a cure by an operation, which keeps out the bowel for a sufficient length of time for the opening to contract and close.

Rules for the Wearing of Trusses.—The truss should be constantly worn, except when the body is in the horizontal position. It should always be adjusted in the recumbent position, never when standing upright. The spring should be opened sufficiently to go round the right leg; it should then be placed round the left leg, and afterwards drawn up into its place, and the pads adjusted in their proper position after the rupture has been perfectly reduced. The object of this is to prevent the breaking, or gradual weakening of the spring.

A duplicate truss is recommended in all cases, not only for renewal of cover, or in case of injury to the original truss, but for the great additional comfort of a "change."

As the truss forms part of the attire, it must be so considered; the inconvenience of wearing one pair of boots or shoes from the time they are new to the time they become worn out, is sufficiently obvious; a new truss is as irksome to wear, and should be brought gradually into regular use.

A bathing truss is always recommended, it being almost impossible to retain the rupture with the hand during swimming, bathing, or ablution. A sleeping truss is sometimes recommended. A soft pad attached to a soft band round the body is usually sufficient. The principle that a rupture should, under all circumstances, be kept up, should always be borne in mind; and the importance of these simple directions can hardly be too strongly insisted upon.

HOW TO USE THE CLINICAL THERMOMETER.[1]

The value of the thermometer in the investigation of disease is at present so generally recognized in theory, that it is unnecessary to enter into any discussion on this subject; at the same time it is needful to impress upon all the extreme importance of employing this instrument in *daily practice*, because there can be no doubt that even now many do not use it to the extent which it deserves. Neither is it requisite to give any detailed description of the instrument. All that need be said is that the thermometer should be sensitive and accurate; of a sufficient

[1] F. T. Roberts, Theory and Practice of Medicine, Phila., 1880.

range; self-registering; and of a convenient size to be carried in the waistcoat pocket. These conditions are fulfilled in the *clinical thermometers*, which are sold in most respectable instrument shops. Special instruments are employed for taking surface temperatures.

Mode of Use.—The regions usually employed for taking the temperature by means of the clinical thermometer, are the axilla, the inner side of the upper part of the thigh, the mouth, rectum, or vagina. Sometimes it is requisite to determine and to compare *local* temperatures. The instrument must be kept in close contact with the surface, and completely covered. When the temperature is taken in either axilla, which is the most convenient place in most cases, the patient should lie on the same side, and press the arm firmly to the side; or it may be occasionally necessary to strap the thermometer to the surface by means of plaster. The mouth does not afford accurate results, but it may conveniently be made use of to give approximate information, the thermometer being placed under the tongue, and the mouth firmly closed. With regard to the time required for the instrument to be retained in its position, there is a difference of opinion. With proper precautions, *five minutes* is usually sufficient, especially if "two observations at intervals of one or two minutes give exactly the same result" (Aitken). To be strictly accurate, however, many think that the mercury ought to *remain stationary for five minutes.* Baumler gives, in order to be scientifically correct—for the rectum three to six minutes; mouth, nine to eleven minutes; axilla, eleven to twenty-four minutes.

It is desirable, if possible, that the individual upon whom the observation is made, should have been at rest in bed for at least an hour previously. Not unfrequently, however, the thermometer has to be employed without

any such preparation. The intervals at which the temperature should be taken will vary according to the nature of the case. Often, only one observation is required. In most instances twice a day is sufficient, viz., in the morning and evening, and in many, once daily is enough. Sometimes, however, it is most important to note the temperature at very frequent intervals, or even to allow the thermometer to remain constantly applied. Should this be needful, it is advisable to teach the nurse or some other intelligent person how to use the instrument, by whom it might also be employed, if any unusual symptoms should arise. In all febrile cases it is requisite to have recourse to the thermometer until convalescence has been firmly established, for reasons to be presently indicated.

In using the thermometer, the points to be observed are: 1. *degree of heat*, as indicated by the *end of the index most distant* from the bulb of the instrument. 2. The *rapidity with which the mercury rises*, this being in proportion to the height of the temperature. It is often important to take a note at the same time of the *frequency of the pulse and respirations*; and, in some cases, to make a *quantitative analysis* of the urine, in order to determine whether there is a relation between the temperature and the amount of urea, uric acid, and other waste products discharged. All these observations should be recorded on proper forms, of which several have been planned, the temperature being indicated by angular lines or curves. It may be mentioned here that Fahrenheit's scale is the one followed in this paper.

Temperature in Health and Chief Modifying Influences.—In the axilla the temperature in health averages about 98.4° F. It may range, however, from 97.3° to 99.5°, or even 100°; but if it goes beyond this in either direction,

and remains persistently above or below the normal, there is something wrong. The chief circumstances which influence the temperature in health, are as follows: 1. *The part of the body* in which it is taken. It is higher in internal parts, such as the rectum or back of the mouth, than in external parts; in sheltered regions of the body than in those which are exposed; over the trunk than over the limbs. 2. *Age.* The temperature, according to most observers, is higher in children and young persons than in adults. It is also said to rise in old age. 3. *Time of the day.* During the day the temperature rises until evening, and then falls slowly till early morning, when it again ascends. In this way there is a variation of about 1.5° during the twenty-four hours in adults, but the range is greater in children. 4. *Climate and exposure to heat or cold.* In the tropics the average temperature is a little higher than in temperate or cold climates, and it may reach 99.5°, or even 100° F. Long exposure to great heat or cold will also influence it to a slight degree. 5. *Food and drink.* After a full meal the temperature at first falls, but it rises as digestion proceeds. Fasting lowers the temperature. Alcohol seems to cause a speedy fall, but this is only temporary, and a considerable quantity is required in order to influence the temperature materially. Certain articles of diet in daily use produce some effect, such as tea and coffee. 6. *Exercise* increases the temperature, especially that of the extremities, provided it is not sufficient to induce great fatigue. 7. Prolonged study and other forms of mental effort cause a slight depression. 8. Professor A. B. Garrod has found that the temperature rises on stripping off the clothes, and exposing the surface of the body, and the difference is greater in proportion to the coldness of the surrounding air. When the temperature of the air is above 70°

F., there is a slight fall, but a rise to the previous temperature soon takes place.

The chief *source* of the animal heat is almost universally believed to be the chemical and vital changes in the food and tissues, especially the muscular tissue, which are constantly going on in the body, the heat thus produced being diminished by evaporation from its surface, while the circulating blood renders the temperature tolerably uniform throughout the system. The influence of the nervous system upon temperature has been already considered. Dr. Beale believes that the conversion of non-living into living material is the cause of the production of heat.

Uses of the Thermometer in Disease. — In the great majority of cases disease tends to raise the temperature to an abnormal height, there being more or less *pyrexia;* and it is for the purpose of accurately determining the degree of this increased bodily heat that the thermometer is chiefly employed. Occasionally the animal heat sinks below the normal, or it may be unequal in different parts of the body; but these deviations are not nearly of so much consequence as a general rule. At present, it is only intended to sum up concisely the circumstances under which the thermometer may prove serviceable. The peculiarities which individual diseases present as regards temperature present a distinct field of study.

The information afforded by the thermometer may give valuable assistance in: 1. Diagnosis; 2. Prognosis; 3. Treatment.

1. *In Diagnosis.*—Much help is constantly derived from the thermometer with respect to diagnosis, and the following remarks may serve to gather up the circumstances under which it is thus useful. *a.* In many cases which present themselves in ordinary practice, where symptoms

exist which might or might not belong to the premonitory stage of some acute illness, all doubt may at once be cleared up by taking the temperature. Thus we have frequently found in the out-patient room that, when symptoms suggestive of scarlatina or smallpox were complained of, by the help of the thermometer we have been enabled to negative the supposition of either of these diseases being present, or, on the other hand, to corroborate such a suspicion. In short, the instrument enables us at once to determine whether *pyrexia is present or not*, as well as its *degree*, and thus becomes a most valuable aid to the practitioner, which he should ever keep in mind. *b*. Occasionally by one, or at most two observations, it is possible to ascertain positively the *nature of a fever*. For instance, if the temperature suddenly rises to 104° or 106° F., the patient having been quite well on the previous day, he is probably suffering from some form of malarial fever; and this is certain, if the temperature falls rapidly, so that it becomes normal in a few hours. *c*. Many febrile disorders are now known to have tolerably *regular and uniform ranges of temperature* throughout their entire course, and to present peculiar diurnal and nocturnal variations, the temperature being, as in health, generally higher by night than by day. It is therefore essential to become acquainted with this portion of the *natural history* of each of these affections, and to employ the thermometer regularly in investigating them, so that they may be thus distinguished from each other, and from all complaints which may simulate them. *d*. The *habitual use* of the thermometer may lead to the discovery of disease when there is no obvious sign of its existence, for the fact of a patient presenting a temperature above the normal should always call for a more minute examination, which would probably lead to a satisfactory diag-

nosis. This has been frequently observed by those who employ the thermometer in lunatic asylums, who have thus detected phthisis in insane patients, when they could not otherwise have suspected it. *e. Complications* occurring during the progress of fevers, or during the period of convalescence, as well as *relapses*, are indicated either by a disturbanee of the typical range, by delayed defervescence, or by a rise in temperature, after it has once subsided, and either of these deviations may be the first thing observed. Hence the necessity of taking a daily note of the temperature, until the patient has perfectly recovered. *f.* In certain diseases the thermometer gives information as to the *activity of the progress* of a morbid process; for instance, in pulmonary phthisis. Further, it may occasionally help in distinguishing between *different forms* of this complaint. Again, in connection with hæmoptysis, the thermometer is useful in indicating inflammation which may be set up by blood extravasated into the respiratory organs. The same remark applies to the effects of an apoplectic clot in the brain. *g. Inequality of temperature* in different parts is sometimes of aid in diagnosing paralysis, or other nervous disorders. Of late attention has been particularly drawn to the value of comparing local temperatures in the diagnosis of brain affections and of pulmonary phthisis.

A word of caution is necessary with regard to children. In these subjects, the temperature may run up rapidly to a considerable height, when there is nothing particular the matter, and therefore care must be taken not to jump to a hasty diagnosis of some serious disease, simply because the thermometer indieates much bodily heat. It often falls with equal rapidity.

2. *In Prognosis.*—The temperature may be of use in assisting towards a prognosis, either in itself, from its re-

lation to the pulse, respirations, or amount of excreta, or from its association with other symptoms. *a. The degree of heat* observed during the early period of a febrile disease, especially when taken in conjunction with the prominent symptoms, will often give a good idea as to whether the particular case under observation is likely to be a severe one or not. If the temperature is at all high, it shows that a sharp attack may be anticipated, and that complications resulting from the presence of products of decomposition in the blood are liable to arise; therefore a guarded prognosis should be given. *b.* A *very high temperature*, especially when it exhibits a tendency to a continuous and rapid rise, is extremely dangerous, especially if the excretions are deficient. *c.* A *sudden change* in the temperature may be premonitory of some coming event, even for some days before this actually occurs. Thus a marked fall in cases of typhoid fever not uncommonly precedes hemorrhage from the bowels, and gives warning of its approach. *d.* If the temperature *does not increase*, or if it *falls from morning to evening*, this is a favorable sign; if it is *higher in the morning* than on the previous evening, this shows that the disease is advancing, and the prognosis is consequently more grave. *e.* In many pyrexial diseases the fever usually subsides on certain days, often by *crisis;* if in a particular case the expected fall takes place, and defervescence goes on regularly and continuously, the prognosis is favorable, if the contrary happens, or if the decline of the fever is irregular, an unfavorable course is indicated. *f.* Should the temperature *decline rapidly* in certain acute febrile affections, such as pneumonia or typhus fever, while the pulse and respirations increase in frequency, and the other symptoms show no signs of improvement, but on the other hand become worse, the prognosis is very serious. A very low temperature is in itself an evil omen.

It must be remembered that accidental circumstances may temporarily modify the temperature in disease as in health, such as food, exercise, excitement, etc. It may be increased by sources of irritation, *e. g.*, retained urine or feces, on the removal of which irritants it is often markedly reduced. Defervescence may proceed so far that the animal heat is brought below the normal, sometimes considerably. After convalescence from severe continued fevers, the temperature often remains low for some time. The same condition is also observed during the apyrexial periods of intermittent fever and in the remissions of the remittent variety.

3. *In Treatment.*—The value of the thermometer, as affording indications for treatment, may be gathered from the remarks already made, and it will be only necessary to give two or three illustrations. A *very high and ascending temperature* calls for prompt recourse to the use of cold. In *ague*, after this disease has apparently subsided, it is found that the temperature still rises at the usual intervals, and until this has become quite normal for two or three days, treatment must not be discontinued. During *convalescence from fevers* an increase of the bodily heat may be due to something wrong in the diet, or in the use of medicines, and such an event should lead to careful inquiry on all matters which might tend to raise the temperature, so that appropriate measures might be adopted to remove the source of disturbance.

HOW TO APPLY BANDAGES.[1]

There is nothing more difficult to attempt clearly to describe, than the way, or rather the different ways, of applying a bandage.

Bandages are generally made of unbleached muslin, of flannel, linen, etc., and are used for different purposes. Sometimes they are used as supports to the different parts of the body; again we use them in order to apply pressure; also for fixing splints, dressing, etc.; and lastly, for the purpose of allaying muscular action.

The chief kinds of bandages are the *Roller* and the *Triangular Bandages.*

The Roller Bandage.—Now what are the usual sizes and lengths of these bandages? I cannot do better than arrange this in a table, where you will be able to see at a glance what is required.

	Width.	*Length.*
Finger bandages, ...	$\frac{3}{4}$ inch.	1 yard.
Arm "	$2\frac{1}{2}$ inches.	3— 6 yards.
Leg "	3 "	6— 8 "
Chest "	4—5 "	8—12 "
Head "	$2\frac{1}{2}$ "	4— 6 "

The next thing to know is, *How to Roll a Bandage!* You first fold one end of your bandage two or three times, as tightly as you can, thus making it into a small roll. You now take hold of this by the fingers of both hands, both thumbs being placed on the top of it, while the rest of the bandage is, if possible, held by another person, who keeps it moderately strained. The thumbs now, by an alternate movement, make the roll revolve on its own axis, the fingers

[1] Condensed from "Ambulance Lectures," by L. A. Weatherly, M.D., London, England.

at the same time holding it in position between the two hands. When it is all rolled up, and if not wanted for use at once, the end should be fastened by a stitch or pin, to prevent unrolling.

How to Apply a Roller Bandage.—We may apply a roller bandage in three different ways, and these are called as follows: 1, a *simple spiral bandage;* 2, a *reverse* or *recurrent bandage;* 3, *a crucial* or *figure-of-8 bandage.* It is a wise plan, in all these three ways of using a roller bandage, when first applying the bandage to leave the end a little long, and then, when the first turn is made, by turning this end over, and bandaging over this again, it is kept firm and prevented from slipping.

The Simple Spiral Bandage.—The application of this bandage consists in simple spiral turns, each turn overlapping the preceding one to the extent of about two-thirds of the width of the bandage. It is, however, so apt to slip, that we usually have recourse to

The Reverse Spiral.—This is applied like the former, except that the bandage is turned back upon itself each time it is carried round the limb. This form of applying a bandage is one that is not at first easily learned, and requires a good deal of practice before it can be neatly and nicely done. The thumb or forefinger of the hand not holding the bandage should be placed upon the bandage at the part where the turn is to be commenced, while the other hand turns the bandage back upon itself.

The Crucial or Figure-of-8 Bandage.—This form of applying a bandage is usually used at the joints, and it is always used when you apply a bandage over the ankle-joint in bandaging from the foot up the leg. You carry the bandage over the upper part of the joint, then down, under, and across the lower part, and then up over the upper part again, thus forming a regular figure-of-eight.

I will now give you a few rules that always ought to be observed in using the roller bandage:—

1. Bandage from within outward.

2. Commence bandaging from below, and work upward.

3. Take care that the pressure is evenly and uniformly applied, but not too lightly.

4. Avoid all wrinkles in your bandage.

5. In reversing or turning a bandage over, always do so on the fleshy side, and not over the sharp edge of a bone.

How to Fasten a Bandage after it is Applied.—You can do this in three different ways: firstly, by putting a stitch in it; secondly, by pinning it; and thirdly, by tearing the bandage down the centre for a little distance, and then turning one end round one way and the other in the opposite direction and tying these two ends. This last is an untidy and clumsy way of doing things, and should not be resorted to unless no pin is at hand. The stitch is by far the best and neatest way of fastening a bandage.

Triangular Bandage.—Professor Esmarch has introduced this form of bandage, and its usefulness will be readily acknowledged when I tell you that it can be applied in no less than thirty-two different ways. The dimensions of this bandage are as follows: Its lower border measures four feet, and the two side borders two feet ten inches each. If this bandage is not at hand, a large-sized pocket-handkerchief, folded from corner to corner, or cut across in that direction, will answer the purpose. It is applied either folded, like a neck-handkerchief, or unfolded; and in folding it as a neck-handkerchief it may be made narrow or broad, as required.

HOW TO APPLY IMMEDIATE RELIEF IN RECENT ACCIDENTS OR SUDDEN ILLNESS.[1]

The following rules, as to the course to be pursued by the general public, in cases of emergency, will be found useful in the experience of the practitioner, and are such as he may impart to his patients for their guidance:—

Arrest of Bleeding.

Loss of blood, whether it be from an artery, a vein, or from the capillaries, is called *hemorrhage*. To distinguish between arterial, venous, and capillary hemorrhage, is not very difficult, but yet it is very important. When blood flows in a steady stream, wells out, as it were, and is dark colored, you may be sure it is from a *vein;* if, however, it flows out with great force, and in jets, as if it were being squirted out, and is of a bright red color, then it is from an *artery;* and when bleeding is only from the *capillaries*, there is simply a general oozing. Of course, the larger the vessel, and the wound in it, whether it be an artery or a vein, from which the blood comes, the greater the danger; but arterial hemorrhage is infinitely more dangerous than venous, on account of the force of the current of blood being so much greater through the arteries. Bleeding from a wound of any of the larger main arteries, of even the limbs, such as the brachial or femoral, if not arrested in some way, is sufficient to end life in a few minutes. But, in the large majority of wounds of our bodies, nature arrests this otherwise fatal bleeding in a wonderful manner. The coats of the arteries are both muscular and elastic, and it happens that when an artery is torn across, its coats *contract;* and this contraction, by reducing

[1] Condensed from "Ambulance Lectures," by L. A. Weatherly, M.D., London.

the size of the orifice, diminishes the jet of blood, and the blood current being thus arrested the blood clots, and this clot closes up the mouth of the wounded artery. If ever you have to deal with a serious wound, in which you might reasonably expect severe bleeding, but in which the bleeding seems to have stopped, don't meddle in any way with it, by washing, etc., for by so doing you may very easily disturb these clots, thus naturally formed, and bring on a renewal of the bleeding. If, however, nature has not succeeded in checking the hemorrhage, what is to be done? The great means we rely upon for arresting hemorrhage for a time, is *pressure,* and this pressure can be applied by different means and in different ways. It stands to reason, that if the bleeding is from a *vein,* that the pressure must be applied to the limb *away from the trunk,* i. e., *below the point of bleeding;* if, however, from an *artery,* then we must apply the pressure *between the wound and the heart,* i. e., *above the point of bleeding.* The direction of the blood currents in the veins and arteries makes the reason for these rules perfectly clear.

Now we may apply this pressure in cases of severe *arterial hemorrhage,* by the aid of a pocket handkerchief tied round the limb, over a firm pad, placed above the course of the main artery of the limb; then by inserting a stick under the handkerchief, and twisting it, such pressure is brought to bear upon the artery that the circulation of the blood through it is stopped. A piece of stone or any hard substance at hand will answer the purpose of this pad; and if no stick is at hand, one's own fingers can twist up the handkerchief tight enough. To apply pressure in this way you must know where the main arteries run, so as to fix the pad over the course of the one required to be compressed.

In applying the elastic tube, having a hook at each end, devised by Professor Esmarch, no knowledge of the course of

the arteries is needed. You simply stretch the tube to the full, and wind it, while stretched, round and round the limb, and then fasten the hooks to each other. It would be a wise plan if one of these simple and capital tubes were kept at all the large railway stations and other places where accidents are of frequent occurrence.

If severe arterial bleeding is taking place in the neighborhood of joints, it may be arrested by simply forcibly flexing the joint which is above the wound, or rather nearest to the body; for instance, if you have a severe wound and bleeding of the leg below the knee, by forcibly flexing the leg upon the thigh at the knee-joint, and the addition of a firm pad in the hollow of the joint, and keeping it in this position, you will find that the hemorrhage is soon controlled.

With regard to *venous hemorrhage*, the pressure has to be applied on the opposite side of the wound to that when an artery is wounded, and the pressure of a handkerchief alone, if tied sufficiently tight, is usually enough to stop the bleeding, at the same time taking care to keep the limb elevated. With regard to the bleeding from capillaries, it is very easily controlled, by either direct pressure to the wounded part, or by simple exposure of the part to the cold air, etc. Mr. Herbert Page, of London, has drawn up a capital set of rules for the guidance of the men employed on the London and Northwestern Railway, entitled "How to Stop Bleeding (arterial) with or without the Elastic Tube." They are as follows:—

1. When a leg or arm is severely wounded, there may be no bleeding; in this case, raise the limb on cushions above the level of the body, and carefully watch the wounded part so that the first bleeding may be seen.

2. Should there be much bleeding, put on the elastic tube as soon as possible (*see Rule* 3); but if you have not the tube

near, raise the limb as high as you can above the body and act as follows:—

(*a*) If blood seems to come smartly from one point, place your finger or thumb firmly on that point, and stop up the place from which the blood is coming.

(*b*) If you cannot see whence the blood flows, then roll up your handkerchief or cap, and with it press firmly on the bleeding part, not forgetting to keep the limb raised up.

In case of slight bleeding either of these means just given, Rule 2 (*a*) (*b*), will generally be sufficient, the limb being kept raised up.

3. There is no difficulty whatever in putting on the elastic tube. Let the limb be held up as high as possible, then stretch the tube to the full, wind it, while stretched, round and round the bare limb, and fasten the hooks, at the ends, to each other.

If bleeding still goes on after the tube has been put on, you may be sure it is not tight enough. You had better, therefore—with the limb still raised—take off the tube, and apply it again, more tightly than before.

4. The tube must be placed above the wounded part—that is, between it and the body.

When the leg or foot is injured, apply the tube just above the knee; if the knee or thigh be wounded, then place it higher up, on the thigh.

If the hand or wrist be wounded, put on the tube below the elbow; if blood come from the elbow or arm, then put on the tube higher up, near the shoulder.

5. If the limb be wounded so near the trunk that you cannot put on the tube, then you must do your best to stop the bleeding by one of the plans named in Rule 2.

6. If the injured man has to be carried far, either to a Hospital or his home, bear in mind—

(*a*) To keep him warm with clothing.

(*b*) To keep the limb continuously raised on cushions.

(*c*) To look out for bleeding.

(*d*) Not to give too much brandy, especially if you have not been able to put on the tube.

Immediate Treatment of Wounds.

In speaking of wounds I mean only the slight ones. Any deep or extensive wounds had best be left alone until the arrival of a surgeon, except so far as arresting the hemorrhage from them is concerned.

Wounds may be *incised,* as when made by a clean cutting instrument; *punctured,* when the depth exceeds the breadth, as wounds from stabs; *lacerated,* when the parts are torn and the lips of the wound irregular; and *contused,* when effected by bruising.

In the treatment of these the following are the chief points to be attended to:—

1. *Arrest the bleeding.* In most cases of moderately slight wounds, simple elevation of the part and the application of cold or moderate pressure will suffice.

2. *Remove all foreign bodies,* such as dirt, glass, etc., as soon as possible.

3. *Bring the wounded parts in nice apposition,* and keep them so, and this is best done by means of strips of adhesive plaster, first applied to one side of the wound and then secured to the other. These strips should not be too broad, and *space should always be left between* the strips of plaster to allow any matter to escape. If the wounds are too extensive to be kept together by plaster, the surgeon must at once put in some stitches.

These rules apply more particularly to incised and slightly lacerated wounds. With regard to punctured and severely lacerated or contused wounds a surgeon should be sent for,

although no harm can be done, unless there is any likelihood of much bleeding, by in the meantime washing the wound and removing all other substances. Incised wounds of the face ought to be brought together as quickly as possible, to prevent future disfigurement. All wounds about the head are very liable to erysipelas.

Immediate Treatment of Fractures.

Fractures or broken bones may be of three classes, viz.: a *simple fracture,* when the bone is simply broken through in one place; a *compound fracture,* when there is a wound in the flesh communicating with the broken ends of the bone; and a *comminuted fracture,* when the bone is broken into pieces. Now what are the symptoms of fractures? We have first of all the history of the accident, the patient having generally felt or even heard the bone snap; then we have *deformity* of the limb, such as shortening or bending, and if we take hold of the limb, we find there is *increased mobility,* and also we hear and feel a peculiar grating caused by the broken ends of the bone rubbing against each other, and this is called *crepitus.* We have, as well, *pain* in and *loss of power* of the limbs.

With regard to the immediate treatment of broken bones, it is not imperative to do anything to a broken limb before the arrival of a medical man, except to keep it at perfect rest; unless the patient has to be moved, and then it becomes absolutely necessary, to prevent further mischief, that the broken ends of the bone should be put in apposition and kept there. It is a very easy thing for a simple fracture to be converted into a compound one during the removal of the patient, unless this is done; and as a compound fracture is a most dangerous accident, it is easy to see how positively necessary this rule is.

To place the broken ends of the bones in apposition, if

there be much deformity, we must produce extension of the limb; and this is done by getting one person to hold the broken limb above the seat of the injury, while you pull at the lower portion of it and extend the limb away from the trunk. When the deformity has disappeared, and the limb is straight, you have now to keep it in this position; and this is done by means of splints. Extemporized splints may be formed of numerous things, such as folds of newspapers, umbrellas, twigs of trees, etc. A very useful temporary splint can be quickly made by putting a coat or waistcoat underneath the broken limb, and then rolling it up from each side towards the sides of the limb, and then securing this by means of two or three handkerchiefs tied round. One of the ordinary trellis flower pot covers, if at hand, makes a most useful temporary splint; after first of all putting some soft material round the limb. If no such material is to be had, this simple splint could be put over the sleeve in the case of a broken arm, or over the trouser if it is a broken leg, and the patient is a man.

A broken leg should always be fastened, after being put up in splint, to the sound leg by a handkerchief at the ankle and above and below the knee, before the patient is removed; and for further safety's sake it is well to fasten a piece of board under the legs.

A broken thigh may be treated before removal of patient by firmly drawing down the injured limb by traction at the ankle, until it corresponds in length with the opposite limb; and then fastening the two legs together at the knee and ankle, by handkerchief or bandages. It is always, however, safer to apply, as well, some form of splint, and the rolled up coat for the sides, and a piece of thin board or other substance for the front of the thigh, would ensure almost perfect safety during transit.

A fractured arm requires the immediate support of a sling,

which may at once be made by a handkerchief fastened round the neck.

With regard to the deformity arising from fractures of the extremities, if only one of the two bones of the leg or forearm be broken, the deformity would be very slight, and perhaps imperceptible, as the sound bone keeps the limb straight and the broken ends of the bone more or less in position; still, even in these cases, splints are necessary, and the same precautions should be used before the patient is removed.

Fractures of the Ribs are of very common occurrence, and give rise to great pain, because every time the injured person breathes, the ribs rising and falling allow the broken ends to grate against each other and on the pleura. The temporary method of relieving this pain and keeping the broken ends in apposition, is by rolling a good wide flannel or muslin bandage pretty tightly round the chest, three or four times.

With regard to flesh wounds in connection with broken bones, no better or simpler dressing can be used at the time than fine linen rag and pure cold water.

Foreign Bodies in the Eye.

There are none of the minor accidents to which we are liable, more frequent than this, and what can be much more painful or irritating? Now one of the most general things that we do when we get anything in our eye, is most vehemently to rub the injured organ, with the vain delusive hope of rubbing the offending body out. Instead of which we only make the eye dry, inflamed and more painful; and in all probability, if the foreign substance be at all pointed, as for instance, a piece of iron filing, a stone chip, etc., we make the extraction of it infinitely more difficult.

No matter what it is that has gotten into the eye (with perhaps the exception of mortar and lime) always remember this—viz., to keep the eyelids closed for as long as you can,

without touching them. When a foreign substance gets into the eye and we at once close the eyelid without rubbing it, this fluid welling out will, in most cases, be sufficient to wash the offending substance, if not absolutely on to our cheek, yet so near to the edge of the eyelid as to be easily removed. Should this not answer, it is best to gently bathe the eye with a moistened soft handkerchief or sponge. If, however, a piece of flint or iron, or other hard substance, be in the eye, you will generally find it under the upper eyelid, and to remove it from this position we must turn up the lid; this is done by laying a small probe, or the blunt end of a darning needle, or a worsted needle, across the upper lid, about half an inch from its margin; then by taking the middle eyelashes between the finger and thumb and drawing them outward and upward, while at the same time the probe is gently pressed upon the lid, and the patient is told to look down, the eyelid is easily everted. The foreign body then comes into sight, and can be readily removed with something soft, as a camel's hair brush, a feather, etc. If, however, the body be embedded, and consequently does not move, surgical interference will be necessary. Mortar or lime in the eye occasions great pain and injury if not quickly removed. If seen *immediately* the eye should be well washed with a tepid solution of vinegar and water (about a teaspoonful of vinegar to two ounces of water), and the lid being everted, as before described, all particles should be removed. A drop or two of oil dropped into the eye after will often greatly soothe it.

Foreign Bodies in the Ear.

Unless the foreign body be quite close to the orifice and readily capable of being removed, the patient should himself *never* attempt to meddle with the ear. It is most dangerous, and the extraction of any body far into the ear canal ought to

be left entirely to the surgeon. Even syringing, under these circumstances, had much better be left to the medical man, for injudicious syringing might do much more harm than any possible good.

If the substance that has got in the ear be small, you may try the expedient of letting the patient hang his head sideways, with the ear in which the foreign body is downward. Then give a smart but not hard slap on the other side of the head; and probably the offending substance will fall out. Should an insect be in the ear, the patient should lie on the other ear, and a few drops of warm oil should be dropped into the ear in which the insect is; by these means the annoying animal will quickly rise to the surface, from whence it can be soon and easily removed. If no oil is at hand, water will do equally well.

Treatment of Burns and Scalds.

In all cases of burns and scalds, except in the very slightest ones, the patient should be seen as soon as possible by his physician; as, besides the local treatment, the constitutional symptoms consequent upon these accidents require grave attention. With regard to the immediate local applications, the patient's clothes having been most gently and cautiously removed, being cut in all places where they adhere to the burned and scalded skin, and any blisters having been simply pricked, the surface should at once be covered with some unirritating substance which excludes the air and keeps up a good heat. For this purpose many things are advocated, such as flour, starch, a mixture of collodion and castor oil, or "Carron Oil," which is equal parts of lime-water and linseed oil, and is a most popular and good application. A smooth, thick layer of cotton wool should be laid over this, or if this is not at hand, wrap the patient in a blanket; but be sure and not let the blanket touch any raw

places without the intervention of a piece of fine linen rag soaked in oil of some sort. Otherwise it would stick to the part, causing great and needless pain when the surgeon removes it to examine the extent and depth of the burn or scald.

Linen dipped in a solution of carbonate of soda or potash and applied to the burns or scalds relieves the pain sooner than anything; this is very much used now, in such cases, and almost always with great relief.

Treatment of Bites of Rabid and other Animals.

With regard to *bites of dogs*, a handkerchief or anything else that would answer the same purpose should be as soon as possible tied tightly around the limb, between the bite and the heart, so as to stop the poison from getting into the general circulation, if possible. The wound might then be well sucked, bathed with water, and a strong caustic applied, and by far the best is the strong nitric acid. If the bite has been inflicted by an animal known to be rabid, the patient should at once be taken to a surgeon; but otherwise it is better not to let the patient imagine any serious consequence resulting from the bite.

With regard to *snake bites*, these have been best treated by the free use of stimulants, as ammonia or brandy, so as to attempt to counteract the great prostration which always ensues, burning the wound which the fang has made with nitric acid, and by following out the instructions already given with regard to bites of rabid animals.

Stings of insects are exceedingly painful, and sometimes give rise to great swelling, and even inflammation, and the best treatment for these is to withdraw, if possible, the sting, and then to apply to the wound a strong solution of ammonia, either in spirit or in water. Sal volatile with a little laudanum is also a very efficacious application. Of course,

if there be any depression or fainting consequent upon these stings, some stimulant, such as brandy and water, should be given. A sting of a wasp or bee may be best extracted by pressing a watch-key firmly over it, so that the sting is squeezed up into the hollow of the key.[1]

Treatment of Frost Bite.

The great object in the immediate treatment of frost bite is to bring about *very gradual reaction* of the circulation in the part. This is best done by placing the patient in a room without a fire and gently and continuously rubbing the part with snow or some other cold application. Never apply heat, as by so doing you may easily set up mortification. A little warm coffee or brandy and water may be given if necessary, from time to time.

Treatment of Sprains.

The definition of a sprain is "a sudden forcible stretching of the tendons or ligaments, or both combined, of a joint," and it is an accident that is always accompanied by most acute pain, and generally followed by rapid swelling. As it is always a tedious and troublesome affair, and as it often leads to more serious results, it is wise in all cases, except the very slight ones, that a surgeon should be called in. The immediate treatment is, to give the injured part at once perfect rest, and keep it in an elevated position, applying cold water continuously. Another way of treating immediately a sprain, is to immerse the injured part in a vessel of as hot water as can be possibly borne, and after keeping it there for, say fifteen minutes, to apply frequently hot bran poultices. This plan often gives very great and speedy relief. But as in many cases of supposed severe sprain it is difficult to say whether or no one of the bones

[1] The treatment of Poisoning has already been referred to (page 288).

forming the injured joint is broken, it is wise to treat these by the same rules as those laid down as to the treatment of fractures before the removal of the patient.

Treatment of Spitting of Blood.

If spitting of blood from the lungs is excessive, it is very alarming and dangerous; and although, as a rule, the person suffering from it is under medical treatment, it often happens in severe blood-spitting, that the loss is very great before the arrival of the surgeon. What, then, should be done at once in these cases? Let the patient have plenty of fresh cold air to breathe, apply cold wet cloths to the chest, and give a dose of turpentine, about a tablespoonful, in a little milk; and last, but not least, after adding to a small jug of boiling water a couple of tablespoonfuls of turpentine, let the patient inhale the vapor from it. This last remedy will usually stop the hemorrhage as soon almost as anything; but all these remedies had better be combined.

Treatment of Insensibility.

One golden rule ought to be laid down for the guidance of the general public—viz., *always to treat every case of insensibility as if it were of the gravest nature, and to remove the patient as quickly as possible to the nearest hospital or medical man's house.*

The chief causes of insensibility, and by insensibility is meant the suspension of the functions of animal life, except those of respiration and circulation, are: 1. Injuries to the brain, with or without fracture of the skull itself. 2. Diseases of the brain, such as apoplexy, epilepsy, tumors of the brain, etc. 3. Poisoning by narcotics, as opium, morphia. 4. Poisoning by drink. 5. Blood-poisoning, from advanced kidney disease. 6. Fainting, from failure of the heart's action, either from shock, or excessive bleeding, or exhaustion.

Now, supposing that you find a person anywhere in an unconscious condition, and the smell of the breath leads you to believe that his present state has been caused by drink; always remember this, that even if it be true that the person has been indulging too freely, it often happens that the case is complicated with some other cause, such as apoplexy, etc., and this fact makes the adoption of the rule all the more necessary.

It is always a wise thing to especially note the position and surroundings of the body of an insensible person, for if the case should turn out to be a suspicious one, and foul play were suspected, you, being the first person to have discovered the body, might be severely cross-examined upon these points, before the coroner or magistrate.

I shall simply give a few rules that you may always safely remember and carry out in almost all cases of insensibility:—

1. Place the body on the back, with the head raised.
2. Undo all the clothing round the neck.
3. Allow a free circulation of air round the patient.
4. Remove the patient as quickly as possible to the nearest hospital or medical man's house, and the best means of conveyance is undoubtedly the stretcher.

If you should find a person suffering from an *epileptic fit*—which you would be able to recognize by the convulsive spasms of the limbs and body, the contorted and congested face, the foaming at the mouth, and the bitten tongue—you should act on the rules just mentioned; but besides these, you should do all in your power to prevent the patient injuring himself, being careful, however, not to attempt to restrain his movements, as by so doing you often only aggravate all his struggles. Place, then, something soft under his head, put something between the teeth to prevent further injury to the tongue, and watch carefully till the fit is over, and then remove him at once, as before mentioned.

In cases of *fainting* we should at once lay the patient flat, and the head should be brought to the same level with the body, so as to enable the blood to more easily circulate through the brain, for it is this want of power in the heart to propel the blood to the brain that has caused the insensibility. If bleeding is going on, that, of course, must at once be arrested by the rules given under hemorrhage. Eau de Cologne, sal volatile, ammonia, etc., may be all used, but the important thing to remember in these cases is, undoubtedly, the question of position of the head and body. Stimulation, however, is apt to start afresh the hemorrhage arrested by fainting. Brandy given too freely causes the patient to lose more blood.

Reference will be made to the especial treatment of cases of insensibility arising from *narcotic poisoning*, in the consideration of poisoning generally.

In cases of absolutely certain *intoxication*, where there can be no doubt whatever that that is the cause of the insensibility, from the history given by the patient's friends or others, the treatment consists in emetics (which will be spoken of under the heading of treatment of cases of poisoning), cold water applied to the head and warmth to the surface of the body and extremities.

If you notice any blood coming from the ears or ear of an unconscious person, you may be almost sure that it is a case of fracture of the bottom part or base of the skull.

Treatment of Suffocation.

If suffocation has been caused by irrespirable gases, the treatment to be adopted in all these cases is, to remove the patient immediately to the fresh air; to dash cold water in the face and on the chest; to keep up the warmth of the body, and apply mustard plasters over the heart and round the ankles. If these means fail, then, without loss of time, try artificial respiration, as already described.

Treatment of Choking.

Choking is not a very rare accident, and nothing is so likely to alarm any one as this occurrence. When a person has a fish bone or other substance in the throat, the best thing to do is to at once insert a finger into the mouth and press upon the root of the tongue, so as to induce vomiting. If this fails, let the patient swallow a piece of soft bread. If the substance can be felt by the finger, then insert two fingers into the mouth and bring it away, using, of course, the safeguard of putting some hard substance between the teeth, otherwise you may be severely bitten.

Treatment of Sunstroke.

In these cases the patient should at once be taken to a cool and shady place. All tight clothing should be removed at once from the neck and chest. While waiting for a physician give the person cool drinks of water, or cold black tea or cold coffee, if able to swallow. If the skin is hot and dry, sponge with, or pour cold water over the body and limbs and apply to the head pounded ice, wrapped in a towel or other cloth. If there is no ice at hand, keep a cold cloth on the head, and pour cold water on it, as well as on the body. If the person is pale, very faint, and pulse feeble, let him inhale ammonia for a few seconds, or give him a teaspoonful of aromatic spirits of ammonia, in four tablespoonfuls of water, with a little sugar.

SUGGESTIONS FOR THE NURSING OF THE SICK.[1]

A good nurse must be clean, tidy, and neat, both in her appearance and her work; she must have tact and judgment, and be able to quickly discern the temperament of her patient; she must be firm, yet not domineering, gentle and kind, yet at no time giving way; and she must be attentive to the medical man's instructions, and watch carefully all the different symptoms of the patient, so as to be able to answer the doctor's questions at his next visit. It is essential that she should know at once how to carry out the doctor's instructions. She has to apply a poultice, or may be leeches; possibly, too, a blister is ordered or hot water fomentations; or, again, a vapor bath may be deemed expedient. Then a nurse should know how she can best lift or lay down a helpless patient, how she can make or re-make the bed, change the sheets, etc.

How to Make Poultices.

In making all poultices you should remember to have all your things at hand, ready for use and placed before a nice fire, to be thoroughly warmed. Method and rapidity of action are essential to the proper making and application of poultices. In re-applying poultices always remember not to remove the old poultice until you have the new one quite ready to replace it. In order that the poultice should retain its heat it ought to be spread at least an inch thick; but in some cases, where a heavy poultice cannot well be borne, then you can make it thinner, and cover it externally with a layer of

[1] From "Ambulance Lectures," by L. A. Weatherly, M.D., London, England.

cotton wool or oiled silk. They are simply local baths applied to the skin, and are usually made of linseed meal, mustard and flaxseed meal, bread, carrots, charcoal, etc.

Flaxseed Meal Poultice.—This is best made by pouring boiling water into a bowl or basin and then sprinkling quickly the meal into it, at the same time stirring the mixture constantly until a thin, smooth dough is formed. The poultice should always be made with boiling water, and as rapidly as possible, to prevent its cooling. If the water be added to the meal, instead of the meal to the water, you will find it most difficult and almost impossible to prevent your poultice being lumpy, and consequently not at all agreeable to your patient. Having your linen cut to the requisite size, and warmed, you now spread the dough quickly and evenly over its surface, leaving about an inch of free edge of linen all the way round, and this free edge you turn over the meal, and by so doing ensure a neat poultice, readily applied and easily removed.

Bread Poultice.—Slices of bread are put into a basin and boiling water poured over them, and this is placed by the fire. After a few minutes you pour the water off, replacing it again by more boiling water. You now pour this off, and after pressing the bread with a fork until it is of the proper consistence, you spread this on the linen as before described.

Mustard and Flaxseed Meal Poultice.—For this you want three things besides your linen, viz., mustard, flaxseed meal and boiling water. Equal parts of mustard and flaxseed meal are frequently used; but, of course, this is not imperative, and the medical man will tell you how much mustard he wants used in the poultice. You mix the flaxseed meal and mustard well together, dry, and then, when thoroughly mixed, you sprinkle this into the boiling water, constantly stirring as before described. The spreading and applying is the same as other poultices.

Charcoal Poultice.—This is used frequently for preventing offensive smells from bad sores, as also for promoting a more healthy action of the part. The charcoal mixed with bread and boiling water is the best form, but the surface of the poultice should always be sprinkled with charcoal as well before it is applied.

Carrot Poultice.—This is a very popular form of poultice, and is supposed to make wounds cleaner, and consequently to help the healing process. You simply boil some carrots till they are quite soft, and after having mashed them well with a fork, you spread the pulp on linen, in the ordinary way.

Cotton Wool, thoroughly warmed and applied quickly to the part, answers also remarkably well, and is an admirable application after the removal of a flaxseed meal poultice, but, of course, would not do for any wounded surface.

Mustard Plasters are often ordered as a quick counter-irritant. The mustard for this purpose should always be mixed with *cold* water, and care should be taken that it is fresh and good. This may be known by the pungent fumes that are given off whilst you are mixing it with the water. The mustard, having been well mixed with the water, into the consistence of a paste, should be spread on a piece of linen or muslin, and over this a piece of thin cambric or fine muslin may be laid, so as to intervene between the mustard and the skin. In making mustard plasters always remember that boiling water or vinegar should not be used, as they destroy the active property of the mustard.

How to Apply Blisters.

These are often ordered, and are either in the form of a liquid, to be painted over the part, or in the form of a plaster already spread. If in liquid form, it should be applied

with a camel's hair brush over the part, care being taken not to have the brush too wet. After it has dried a small layer of cotton wool may be placed over the surface. To apply the blister in the plaster form, it should be warmed for a moment before a fire and quickly applied. Unless other directions are given, you need not remove it for twelve hours, when it should be dressed. The plaster is then raised from one side and removed, and the blebs are opened with a pair of scissors. After this has been done some simple ointment spread upon lint should be applied, and renewed twice or three times daily. Sometimes when a blister is removed you will find the blebs have not risen at all well, and then you should apply a soft flaxseed meal poultice, which soon has the effect of making them rise. Occasionally the raw surface caused by the blister is ordered not to be healed up, and this is done by removing all the old skin and then dressing it with some other forms of ointment, according to the doctor's directions.

How to Apply Fomentations.

These are applications of hot water, and these may be simple or medicated by addition of any drug. After dipping a piece of flannel in boiling water you next proceed to wring it nearly dry, and this is best done by means of a wringer made of stout towelling attached to two pieces of stick. The flannel is put in this, and the wringer is twisted round until the water is thoroughly squeezed out. If you have no wringer at hand, a common towel will answer the purpose. When wrung thoroughly dry, these fomentations may be used very hot indeed, without any fear of scalding or blistering the skin. After having applied it over the part, it is best to cover it outside with a piece of oiled silk, by which means it retains the heat much longer. After you remove the flannel be sure and wipe the skin dry, and then

cover the part over with some more flannel or cotton wool, otherwise there might be danger of catching cold. *Turpentine fomentations* are applied in exactly the same manner, with the simple addition of a little of the oil of turpentine sprinkled over the flannel after it has been wrung out. Laudanum or any other drug, by the direction of the physician, can be sprinkled over the flannel in the same way.

How to Apply Leeches.

The application of these little animals requires some little skill and attention, as also, often, much patience. The skin must be first washed thoroughly clean with soap and hot water, and the soap then washed off with cold, and the skin wiped nice and dry. A very good way to apply leeches is as follows: Take a wine-glass, and over the mouth spread lightly a piece of linen or a handkerchief, and put the leeches into the hollow and apply to the part; by straining the linen and keeping the wine-glass applied against the skin, the leeches soon bite. Another way is to put them in a small box, and by inverting it over the part they often readily take. Again, you may take them between your finger and thumb and direct the head to the part. Leech glasses are often used, but are seldom necessary, except you have to apply them to the mouth. These glasses are tubes of the size of the leech, and the animal is inserted with the head towards the small end of the tube, and so applied. When the leeches are full they soon drop off. It is more or less dangerous to attempt to pull them off, as sometimes the teeth might be left behind and set up inflammation. If the temperature of the part to which you wish to apply them is high, it is wise to put them into tepid water first.

After the leeches have dropped off, the part should be well bathed with warm water, and if more blood is required

to be taken, a nice hot poultice should be applied. Sometimes leech bites bleed very freely; usually pressure with the fingers or a small compress will stop the hemorrhage. You may want to use leeches a second time, and, if so, the best way to preserve them is to sprinkle some salt over them, which proceeding soon makes them empty themselves of the blood, and after having washed them in cold water a few times, you had best put them in a vessel half full of water and covered with a piece of perforated card-board.

Vapor Baths.

There are many apparatuses for giving patients hot-air baths, and I shall not attempt to describe these; but it sometimes happens that it is absolutely necessary to get the skin to perspire very quickly and thoroughly, and if no such apparatus is at hand, what is to be done? If it be a child, a warm bath and wrapping up in flannel blankets will often suffice; but in the case of adults, if they be helpless or in the houses of the poor, where no baths are to be found, what can be substituted? For this Sir James Simpson devised a most excellent bath, always easy to construct and capital in its action. For it you only want a few soda-water bottles filled with hot water and tightly corked down, and these are wrapped round with pieces of flannel or worsted stockings, wrung out in hot water. These, then, are placed round the patient, in bed, and he is well covered up. In about half an hour you will find a thoroughly free perspiration. The bottles can now be taken away and the patient wrapped up in a flannel blanket for another half hour. If the bed during this process has got at all wet you must remove him to another bed, which has, of course, been thoroughly well aired and warmed. In case no soda-water bottles are at hand hot bricks answer very well. In cases of croup, as also in certain cases of bronchitis, the physician

often wishes the patient to be kept, for at least some time, in an atmosphere of steam, and it is often difficult to know how to do this in the quickest and easiest way, unless you have a regular steam bed and appliances. In the case of children a very good way is to put them in a cradle, under a fairly sized table, then covering this over on all sides with sheets, to place under it, at the foot of the cradle, a vessel with boiling water, which is, of course, to be continually replenished. By this means you can always readily carry out what often appears a difficulty.

How to Lift Helpless Patients.

You may often want to lift some poor, helpless patient, who has been rendered utterly unable to help him or herself, through paralysis, accident or prostration, and it is a useful thing to know the different methods by which you can easily and readily accomplish this. One person can quite comfortably carry a child, but when the patient is an adult it is different. Two persons can manage this in the following way: They take their stand at each side of the patient, about opposite the nates, and stooping down they join their hands under the back and middle part of thighs, and in this way the patient can be easily lifted, carried and put down again. Of course, if a limb be injured, there ought to be a third person to take charge of it. Four persons can lift a patient with great ease and comfort in the following way: Two poles are placed, one on each side of the patient, and the under sheet and blanket are firmly rolled round them. The four persons now stand two at each side, facing the patient, and each one catches hold with one hand the end of the poles surrounded by the sheet, and with the other the pole near its centre. The patient in this way can be easily carried on to another bed or couch, whilst his bed is being made.

How to Change Bed Linen for the Sick.

By this I mean, of course, only the under sheets, and they can be changed in two or three ways. One is to roll up lengthways the dirty sheet one side of the patient and push it as far as possible under his side; now roll up half the clean sheet and place the roll next to the other, and by gently turning the patient over these two rolls and taking away the dirty sheet and unfolding the clean one, you have only to turn your patient gently back, and the otherwise tedious business is accomplished. Another way is as follows: You raise your patient into a sitting posture and roll the dirty sheet from the head of the bed downward as far as possible. You now roll up your clean sheet crosswise, and placing it near to the roll of dirty sheet you lay your patient down again and raise the lower extremities, and then you can easily pull down the dirty sheet as also your clean one, and spreading the latter out and tucking it neatly under the mattress your patient is soon again comfortable.

It is a good rule for the nurse to put down on paper or on a slate all the directions of the medical man with regard to medicines, nourishments, and other things, as also to make notes of all that has happened since his last visit, such as how long and how often the patient has slept, whether on awakening he has appeared refreshed, what time he has taken his nourishment and in what quantities, and numerous other details, which will not only save cross-questioning, but also the physician much time, and give him a clearer account of his patient's condition since his last visit; in fact, he can see it all at a glance.

HOW TO REMOVE THE INJURED OR SICK BY BEARERS OR ON STRETCHERS.[1]

Carriage by Bearers.

If no stretcher or other conveyance can be procured or improvised, you can, by means of bearers or carriers, transport an injured person for a short distance, and the methods of so doing, which I shall now describe, are those drawn up by Professor Longmore, of England. *If only one person be available,* and if the patient can stand up, great help may be afforded him by letting him place one of his arms round the neck of the bearer, bringing his hand on and in front of the opposite shoulder of the bearer. The bearer then places his arm behind the back of the patient and grasps his opposite hip, at the same time catching firmly hold of the hand of the patient placed on his shoulder with his other hand. Then by putting his hip behind the near hip of the patient, much support is given, and, if necessary, the bearer can in this way lift him off the ground, and, as it were, carry him along. If, however, the patient cannot stand, the only way in which one person can remove him is by getting him on his back; but this method is, of course, not practicable in a case where the thigh is broken.

If two bearers are, however, available, the patient may be carried by them in three or four different ways:—

1. He may be carried in a sitting position by the two bearers joining two of their hands underneath his thighs, close to the nates, while their other two hands are passed round his loins and clasped together. The patient, if he is able, can help to support himself by clasping the bearers round their necks.

[1] From "Ambulance Lectures," by L. A. Weatherly, M.D., London, England.

2. A patient can be carried by two bearers, two of their hands forming a seat and the other two arms a back support.

3. Three of their hands may form the seat, while a back support is made by the remaining arm.

4. A seat may be made with all four hands, and this form of seat is well known among schoolboys as the "sedan chair." If the patient is able to sit up and help to support himself by placing his arm over the shoulders of the bearers, it is surprising how long a distance he may be carried by this method.

Carriage on Stretchers.

If we have no regular stretchers at hand, we must extemporize one, and among the many substitutes, I may mention a door or gate taken from its hinges, a window shutter, a hurdle, or even a short ladder. If two poles of sufficient length and strength can be obtained, a stretcher can be readily made with them, together with two coats. The sleeves of the coats are turned inside out, and the poles being put through them, and the coats having then been buttoned up, a very suitable stretcher is at your service. The rules to be adopted with regard to the proper carriage of patients on stretchers hold good, whatever stretcher is used and however many bearers are required. There are special words of command which are used in the British Army for the stretcher drill; by acting together at the word of command additional comfort and safety will be secured to the patient.

1. *As regards the Bearers.* It is best to have three persons to carry an ordinary stretcher (though, of course, if you are using a door or shutter, you would probably want five). Of these three, two carry the stretcher and the other one attends solely to the patient, changing when necessary with either of the other two, by way of relief. For convenience

sake, the bearers are called by numbers. The bearer who marches in front is No 1, the one who marches behind No. 2, and the one who looks after the patient No. 3.

2. *As regards Placing the Stretcher.* Nine out of every ten persons who had never been instructed in stretcher drill would place the stretcher in the wrong position. It should be brought close to the patient, and not be laid at his side, but placed at his head, and the length of the stretcher should be in the same direction as that in which the injured person is lying. If otherwise placed it gets in the way of the bearers' feet, and there is a chance of stumbling over it, and perhaps letting the patient fall.

3. *Placing a Patient on the Stretcher.* As soon as you have your patient ready for moving, as, for instance, the broken leg put in splints, etc., No. 2 gives the word of command, "Fall in." Nos. 1 and 2 now take up their positions, facing each other on the opposite sides of the patient, near the hip bones, and No. 3 falls in on the side of the injured limb. No. 2 now gives the word "Ready." Nos. 1 and 2 stoop down and get each one hand under the back of the patient, near the shoulder blades, and lock them; and their other hands are now passed under the upper parts of the thighs and clasped; No. 3 all this time attending solely to the injured limb. The word "Lift" is now given, and the bearers slowly rise, and when upright, and at the word "March," they slowly march by short steps until the head of the patient is over the pillow on which it is to rest. The order "Halt" comes now, followed by "Ready" and "Down," when the bearers slowly lower the patient on to the stretcher.

4. *Starting with Stretcher.*—After the patient is on it the word of command is given, "Fall in," and Nos. 1 and 2 then get into their positions at the head and foot of the stretcher, and at the word "Ready" they adjust the

shoulder straps and take hold of the handles of the stretcher. Then comes the word "Lift," and they slowly and steadily raise the stretcher.

5. *Marching with the Stretcher.*—Unless a simple rule be always observed in carrying a stretcher, the poor patient may be rolled about from side to side, much to his discomfort and increase of pain; for if each of the bearers march off with the same foot, what happens? Why, of course, at each inclination of the bodies from side to side, the stretcher rolls slightly over. How, then, is this to be obviated? Simply by the bearers "breaking step," *i. e.*, If No. 1 marches off with the right foot, No. 2 must march off with the left, and *vice versâ*. By doing this the stretcher is kept comparatively steady. The step, in marching, must be a short one, and there must be no springing from the feet. The knees should be kept slightly bent, and the hips should move as little as possible. The gait of the Italian hawker carrying a large basket of images on his head, is the one to be copied by the bearers of a stretcher.

6. *Halting and Laying Down a Stretcher.*—The word of command "Halt" is given, then "Ready," and the bearers now get into the position to stoop. The word "Down" follows, and the stretcher is slowly and steadily lowered. "Fall out," and the bearers get themselves free from the stretcher.

The patient is lifted from the stretcher in the same way that he is lifted from the ground on to it.

A few additional rules are of importance.

(*a*) Never allow a stretcher to be carried on the shoulders, for you may easily have an accident by the patient rolling off; or again, the poor creature might die during the transit without your knowing it, and also the patient would be too high up for No. 3 to pay proper attention to the injured limb.

(*b*) Avoid, if possible, crossing fences, ditches, walls, &c.

(*c*) In going up a hill let the patient's head be in front, except when he has a broken leg or thigh, and then the order is reversed, so as to prevent the weight of the body from pressing down upon the injured part.

(*d*) In going down a hill let the patient's head be behind, except in cases of a broken leg or thigh, when this position is reversed, for the reason given above.

(*e*) Always try and get bearers of the same height; if not, be sure they adjust the shoulder straps so as to carry the stretcher as level as possible.

If the patient has to be taken any considerable distance it becomes impracticable that he can be carried by the stretcher.

HOW TO REMOVE SPOTS OF BLOOD, MUCUS, ETC.

Nature of the Spots or Stains.	On White Goods.	On Colored Goods.	On Silk Goods.
Blood and albuminous spots..........	Simply washing out with lukewarm water. From woollen goods of tender colors, blood-spots may be removed by rubbing with the inner side of a crust of bread.		
Mucus, mucilage, sugar, jelly.......	Washing out with lukewarm water.		
Mechanically attached particles...	Beating, brushing, and allowing water to fall from an elevation upon the wrong side of the goods.		
Fats................	Washing out with soap or lye.	Washing out with lukewarm soap and water; or, if woollen goods, spirits of hartshorn.	Benzine, ether, spirits of hartshorn, magnesia, chalk, clay, yolk of eggs.
Oil colors, varnish, resin..............	Oil of turpentine, alcohol, benzine, and then soap.		Benzine, ether, and soap, very carefully and in a very weak solution.
Stearine............	Strong, pure alcohol.		
Vegetable colors, red wine, fruits, red ink............	Sulphurous vapor or hot chlorine water.	Washing out with lukewarm water and soap, or spirits of hartshorn.	As with the preceding articles, but very cautiously.
Alizarine inks......	Tartaric acid—the older the spot the more concentrated.	If the color permits, dilute tartaric acid.	As before, but with great precaution.
Rust, and spots of ink made of nutgalls..............	Hot oxalic acid, dilute hydrochloric acid, and then tin filings, or solution of oxalic acid in a tin spoon. Rust may also be removed by soaking the stains in a weak solution of tin chloride, and rinsing immediately with much water.	Citric acid to be tried; or, in non-colored woollen goods, dilute chloric acid.	Nothing can be done without increasing the evil.
Lime, lye, and alkalies in general..	Simply washing.	Much-diluted citric acid, drop for drop upon the moistened spot, to be spread around by the finger.	
Acids, vinegar, sour wine, must, acid fruits, etc..........	Simply washing; in the case of fruit, also with hot chlorine water.	According to the delicacy of the material and the color, more or less diluted spirits of hartshorn, to be spread around on the spot moistened, drop for drop, with the tip of the finger. Yellow spots produced by nitric acid may be removed from brown or black woollen goods only while fresh, by repeated dipping in a concentrated solution of permanganate of potassium, and then washing with water.	
Tannin substances, fruit or green nut shells, leather.....	Bleaching lye, hot chlorine water, concentrated tartaric acid.	Chlorine water, diluted according to the delicacy and color of the material, applied with a rag, and drop for drop on the spot moistened, alternately applied and then rinsed off.	
Tar, wagon grease as also fat, resin, carbonaceous particles, and wood vinegar...........	Soap, with oil of turpentine, varied with the action of falling water.	Hog's lard to be rubbed on, then soaped and allowed to remain quietly, then washed alternately with water and oil of turpentine.	As in the preceding, but more carefully, and instead of turpentine, benzine and a continued current of water falling from a height, and only upon the reversed side of the spot.
Superficial loss of substance by scorching.........	Rub over thoroughly with a pad dipped in hot chlorine water.	Whenever possible, coloring over, or raising up the nap.	Nothing can be done.

HOW TO PREPARE STAINED SECTIONS OF ANIMAL TISSUES.[1]

The staining of tissues by the more simple tinging agents, as carmine, logwood, and the anilin dyes, etc., is so easy, that it has always been a matter of marvel to me that, of the thousands of slides one sees (I refer now only to those of stained animal preparations), scarcely any are ever stained so as to show the structures to their best advantage; indeed, most of them are utterly useless.

The causes of this failure in producing good and useful stains are several, and in many cases may be due even to the condition of the material when it first comes into our hands; therefore, though this paper is nominally devoted to stains and staining, I shall treat of—

1. Material.
2. Methods of preserving and of hardening it.
3. Cutting of the sections.
4. Tinging agents.
5. Method of staining; and
6. Suggest a few points to which sufficient attention is not generally given in the mounting of the sections, after all the other processes have been satisfactorily completed.

The Material.

This, in all cases, should be as fresh as possible, and I am confident that much of the want of success in staining is due, not so much to inattention to the details of the staining process itself, as to a want of care in having the material quite fresh.

It should always be borne in mind that, though for the knowledge of human histology it is advisable to study it from tissues obtained from the human subject, still it

[1] Read before the Quekett Microscopical Club by J. W. Groves, May 23, 1879, and published in the Amer. Journal of Microscopy, Feb. 1880.

is so difficult to procure these in good condition--to many people even an impossibility—that for general purposes it is far better to utilize similar structures or organs from the lower animals. Though these may differ in some more or less important details, they do in the main furnish all that, for ordinary purposes, we require to know of the similar structures in man.

Decomposition rapidly sets in, sufficiently to impair, if not to neutralize, the subsequent process; therefore, except with certain morbid structures which can only be obtained from the post-mortem room, all normal material, and, where possible, that also which is morbid, should be placed in a preservative fluid, there to be hardened or softened as the case may be, either directly after the death of the animal, or immediately after its removal from the living body.

Preservatives.

These may be divided into two classes: 1st, those which simply prevent further alteration, and 2d, those which, in addition to preserving, at the same time cause hardening, softening, etc., as set forth in the following table:—

1. Simple Preservatives.		Canada Balsam. Glycerine. Goadby's Fluid. Dammar Solution. Glycerine and Carbolic Acid (15.1). Glycerine Jelly, etc.
2. Those which also harden.	*a.* Simply	Alcohol. Chromic Acid (1-eighth per cent. sol'n). Bichromate of Potash (2 per cent. sol'n). " Ammonia (ditto). Müller's Fluid, etc.
	b. Which color also.	Picric Acid (sat. solution). Osmic Acid (1–2 p. c. solution). Gold Chloride (½ p. c. solution). Alcohol and Carmine, etc. Chromic Acid (1-eighth p. c. sol'n) and subsequent immersion in glycerine.

3. Those which also soften.	For Mineral Salts—Acids. " Animal Matters—Alkalies.
4. Those which harden some parts and soften others at the same time.	Chromic Acid Solution and Nitric Acid.

In the preceding table are enumerated the more ordinary and useful preservatives, each of which will be presently noticed separately; though, firstly, I wish to draw your attention to three facts in connection with them, which are of the greatest importance, and to the want of a due regard to which may be ascribed a second cause of failure in procuring good stains, to say nothing of their also being the cause of want of success in cutting thin sections.

These facts are, first, that it is necessary to be careful to employ that strength of the hardening or softening fluid which is most suitable for the tissues to be acted upon. What these strengths should be, it would be impossible to tell for every case, but I will give those which are most usually employed, and, for further details, must refer you to that useful work, "Practical Histology," by Mr. E. A. Schäfer.

The second fact is, that small pieces of material and a large bulk of the fluid must always be employed; say half a pint of fluid for pieces equal to one cubic inch.

The third fact is, that the fluid (even though that may be alcohol) should be changed frequently. How frequently this change should be made can only be learned by experience; but for all aqueous solutions it is well to make the first change after a few hours, then every day or two.

Of the hardening agents, *chromic acid* comes first. This should be used in solutions of various strengths, but provided they are frequently changed, it is better to err on the side of their being *too weak* than *too strong*, for in the

latter case, the tissues become friable, and crumble away before the knife or razor; besides, it is utterly impossible to stain them properly. The most useful strengths are $\frac{1}{8}$ or $\frac{1}{4}$ per cent. aqueous solutions; but before immersing the material in these, it is well to place in it a 2 per cent. solution of bichromate of potash or bichromate of ammonia, for some eight or twelve hours, as they have a greater penetrative power than the simple chromic acid solution, and thus cause the masses to be more evenly hardened. It should be remembered that chromic acid solutions have a tendency to bleach tissues already stained or injected with carmine solutions.

Bichromate of potash and *bichromate of ammonia.*—Either of these may be used in a 2 per cent. solution; the latter being the more generally useful.[1]

Alcohol.—This is perhaps the most generally useful fluid for those who have not much time to devote to the subject, as with it there is less chance of the material spoiling; moreover, tissues hardened by its means give the best results with most of the staining fluids. Alcohol should be used rather weak at first, then stronger, till the material is hard enough to cut, except when the freezing microtome is to be employed.

Müller's solution is another most useful hardening agent, especially for the retina and other nerve structures. Material should be kept in it from three to six weeks. Its composition is—

Bichromate of potash, 25 grammes, or $2\frac{1}{2}$ parts.

Sulphate of sodium, 10 grammes, or 1 part.

Water, 1000 c.c., 100 parts.

The method of hardening tissues by drying them is

[1] Material hardened by immersion in solutions of chromic acid, bichromate of potash, or bichromate of ammonia, should be removed to alcohol at the end of about ten days, or it will become brittle.

open to many objections, among which may be mentioned the alteration of structures, and the difficulty of obtaining thin sections; for, cut them as thin as may be, they will swell when rendered moist again by the subsequent processes.

Softening fluids are usually only required for structures which are naturally hard, due to the impregnation of lime salts, as bone and teeth. For these, acids are required, but as it is generally desirable to retain *in situ* the soft parts connected with them, it is advisable to use, as a softener of the inorganic matter, some fluid which will at the same time harden all the soft or organic parts. For this purpose a fluid consisting of

Chromic acid, 1 gramme,
Nitric acid, 2 c.c. (this added last),
Water, 200 c.c.,

is, perhaps, the best. In making it, care should be taken that the chromic acid and water be first mixed, and the nitric acid added subsequently. It is better to immerse specimens containing lime salts in a one-eighth per cent. aqueous solution of chromic acid, or a two per cent. sol. of pot. bichrom. for a few days before placing them in this mixture, as by that means the soft parts become more perfectly hardened. A few agents, at the same time that they harden, impart a color to the tissues; thus material which has been soaked in chromic acid acquires a green tinge when placed in glycerine. This, though handy for certain purposes, is not generally useful.

Osmic acid, on the other hand, hardens, and, at the same time, imparts a useful *color*, for it selects all fatty matters and tinges them black. After the material has been partially hardened in a one-tenth to one per cent. aqueous solution of this acid, the process may be completed in alcohol, though, if left in acid solution for 12 to 48 hours,

it will be quite hard enough. When hard, it should be placed in distilled water for a day or two, and the sections should be mounted in a saturated solution of acetate of potash (Schultze).

Gold chloride hardens and stains at the same time, but as its powers of penetration are very small, it is chiefly used as a coloring agent.

Picric acid has considerable properties of hardening tissues, whilst it renders them of a bright primrose yellow, but as it is extremely soluble in both alcohol and water, it wants great care in use, if it is desired to retain much of the color. Ranvier states that a concentrated solution will produce excellent results in 24 hours; neither shrinking nor coagulation of the albumen occurring, lime salts being removed at the same time.

Finally, one of the hardening agents, capable of furnishing better results than any other, is the *freezing method*, which has fallen into disrepute with some, because they have considered it inapplicable to tissues just removed from the animal. When thus applied, they have almost invariably failed, not to obtain thin sections (for these can be cut as thin as may be desired), but to manipulate them when cut, as they tear most readily in every subsequent process, and, when finely mounted, it is found that naught is left but the tattered fragments of what should have been a good preparation.

The freezing method undoubtedly enables us to put up specimens sooner than any other, but before they are frozen they must be exposed for some few hours (say 5 to 24) to the action of one of the hardening agents already mentioned, so as to partially coagulate the fibrin and albumen, and thus enable the sections to be put through the after processes without injury.

The fresh material should be first placed in: *a*. A $\frac{1}{8}$ p. c.

aqueous solution of chromic acid; or *b.* A two p. c. aqueous solution of bichromate of potash; or *c.* A two p. c. aqueous solution of bichromate of ammonia; or *d.* In alcohol solution for 8 or 12 hours. It should then be washed in clean water to remove the hardening agent, when it is ready for freezing. With this it is necessary to pound the ice into small pieces, and to mix it thoroughly with an equal quantity of salt; it is moreover necessary to have a free exit for the dissolved mixture.

With material that has been wholly hardened by chromic acid, alcohol, or some other of the reagents above mentioned, the mass must be imbedded in some material for the purpose of supporting the structures, as well as in some cases of affording a wider surface upon which to rest the razor.

For *cutting sections by hand*, the best imbedding materials are :—

1. Olive oil and white wax in equal parts; or 2. Cacao butter: while in machines with hollow cylinders, or for use without any machine, either those of elder pith or of carrot may be employed.

In cutting sections, by whatever process may be preferred, care should be taken :—

1st. That the razor is in perfect condition, and that its surface be kept thoroughly moist—with *water* if the freezing method be adopted, or with *spirit* when any other mode of hardening is used.

2d. That *each* section as it is cut be floated into water or spirit, instead of allowing several sections to accumulate on the razor, as they thereby get torn, or otherwise injured.

Stains.

The next subject we have to consider is that of stains, and how to use them.

The following is a table in which the most useful stains are classified according to their qualities, or method of use:—

A. General stains.		Carmine with excess of Ammonia. Eosin (Dreschfeld). Molybdate of Ammonia. (This requires the action of light.)
B. Selective stains.	Simple. Not requiring action of light.	Carmine (Beale's). Borax Carmine (Golding Bird). Logwood (Golding Bird). Logwood Acid Solution (Schäfer). Indigo Carmine (Tiersch). Anilin Blue (Heidenhain). Picric Acid.
	Simple. Requiring action of light.	Gold Chloride. Silver Nitrate. Osmic Acid. Chloride of Palladium.
	Double.	Molybdate of Ammonia and Carmine. Picro-carmine (Schäfer). Chloride of Palladium and Carmine. Carmine and Indigo Carmine. Logwood and Anilin Blue. Gold Chloride and Logwood. Silver Nitrate and Logwood. Silver Nitrate and Gold Chloride.
C. Which will stain in the mass and harden at the same time.		Osmic Acid. Picric Acid. Gold Chloride. Alcohol + Borax Carmine. Alcohol + Golding Bird's Logwood. Alcohol + Eosin.

With regard to these, I will give some *general rules* applicable to most, and then proceed to notice each separately.

In staining, it is a general rule of almost universal application that the fluid should be weak and the quantity large in proportion to the number of sections, or to the mass, as the case may be. A section which has been in a fluid so weak that 24 or 48 hours, or even more, have been required to produce the requisite depth of color, is almost always better stained than one which has been in

fluid which will produce the same tint in a shorter time, for the following reason: that a fluid commences to stain a tissue directly it comes in contact with it. Now from this it follows that the surfaces of the section are stained much sooner, and consequently more deeply than the intervening portions; and if the fluid is strong, this difference will be great.

Again, to produce the best results, the sections should be as thin as possible, 1. because they take the stain more perfectly; 2. because the thinner they are, the less thickness of colored structures the light has to penetrate before reaching the lenses of the objective; besides, it enables the deeper structures to be more readily examined with high powers.

Those colors are preferable which are cool and pleasant to the eye, *i. e.*, those which contain least red and yellow.

Provided the staining is perfect, and sufficient to show all the detail of which it is capable, the paler it is the better:—

1. Because in the examination with the microscope, less light is required, and consequently a continuous protracted observation is less fatiguing to the sight.

2. The eye is not so immediately attracted by points and streaks of bright color, thereby running the risk of passing over unnoticed, details of structure of equal importance, but which do not obtrude themselves before us with the same glaring pertinacity.

Finally, it may be remarked that it is better to use distilled in preference to ordinary water in all processes connected with staining. With some—as Logwood, Gold Chloride, and Silver Nitrate—this is of the utmost importance.

Those stains which color all tissues alike, are of little use unless employed as a ground to bring out details

which would be left untouched by a selective stain, which can afterwards be used, and then their value cannot be overrated. Thus *molybdate of ammonia* produces a most delightfully cool blue-gray general stain, which in no way interferes with the subsequent use of carmine, when all the nuclei appear pink on a pleasant neutral-tint ground. To obtain this, a five per cent. neutral aqueous solution of the molybdate should be used. The stain is complete in 24 hours, at an ordinary temperature, and under the action of light. Specimens thus colored become brown by supplementary expesure to the action of tannic acid (1–15) or pyrogallic acid (20 per cent.).

Another general stain is a strongly *ammoniacal solution of carmine*, but this is of little use, and is best avoided. *Eosin*, again, is a general stain, which may be used either before or after the sections have been colored with logwood. One part of eosin should be used with 1000 of water. Many of the other stains, too, which are themselves selective, may be used with others which have a still stronger selective power, and thus for the time appear to be merely general stains. In this way may be used—Carmine and Logwood, Carmine and Silver Nitrate, Logwood and Silver Nitrate, Logwood and Gold Chloride, and some others.

Selective Stains.—Of these none is more useful or more pleasant to work with than *logwood;* but it is not so commonly used as *carmine*, because many find it difficult to prepare, and others do not succeed in its use, in consequence, I fancy, of hardening their material in fluids containing chromic acid or bichromates of too great strength.

There are two useful formulæ for the preparation of *logwood solutions*—

1. Kleinenberg's modified by Golding Bird is easy to use; while the older it is the better are the results obtained with it. It is prepared thus: Make saturated solutions of alum and calcium chloride, in proof spirit; mix in the proportions of eight of the former to one of the latter; pound a small piece of ext. hæmatoxyli (the older the better); add to it the mixed solution, and agitate; after two days decant, when it may be used at once, though better after keeping. A watch-glass should be filled with water, and a few drops of this solution added, till the fluid acquires a mauve tint. Into this the sections may be placed, and should remain for 24 hours or more.

The second is *Schäfer's Acid Logwood Solution*, which is especially useful for certain structures, as tendon cells, etc., which could not be so well shown by neutral or alkaline solutions. It is thus prepared: A one per cent. solution of acetic acid is colored by the addition of 1.3 of its volume of logwood solution.

The *Anilin Dyes*, whether in aqueous or alcoholic solution, give good results. The best are:—

Rosanilin or Magenta 1 grain, to ounce of Alcohol; red.

Acetate of Mauvein 4 grains, Alcohol 1 ounce, Nitric acid, 1 minim; blue.

Anilin Black 2 grains, Water 1 ounce; gray black.

Nicholson's Soluble Blue 1-6 grain, Alcohol 1 ounce, Nitric Acid 2 minims; blue.

These, as other stains, should be used weak; but the chief point to be careful about is that, after the sections are stained they should be passed through alcohol and oil of cloves as rapidly as possible, otherwise the color will be dissolved out before they reach the balsam. Heidenhain, speaking of the use of Anilin Dyes, says:—

"The sections, upon removal from alcohol, should remain for a day in a four per cent. neutral aqueous solution, in a moist place, and then be immediately mounted in glycerine and cemented."

Some of the Anilin Dyes are but sparingly soluble in alcohol, whereas they dissolve readily in water. Their color, as a rule, is increased by acetic acid, but removed by ammonia. There are, however, some exceptions.

The use of *benzole* for cleaning instead of clove oil fixes the colors better, but has a tendency to produce shrinking in some structures.

The *indigo carmine solution*, introduced by Tiersch, is a good and useful *blue* stain, especially for sections of brain and spinal cord which have been hardened in chromic acid, and it possesses one very convenient quality, viz., that, if the sections are too deeply stained, the excess of color may be removed by the action of a saturated solution of oxalic acid in alcohol. This reducing process, however, should not be relied on more than is absolutely necessary. It is prepared thus:—

Oxalic Acid, 1 part.
Distilled Water, 22 to 30 parts.
Indigo Carmine, as much as the solution will take up.

Sections should be immersed in this, diluted with alcohol, from 12 to 48 hours, to produce a good color.

Carmine, first used by Gerlach, is a most useful tinging agent, and if preparations are not colored too deeply, it is not disagreeable to the eye.

Beale's ammoniacal solution is very good, and so is *Golding Bird's borax carmine solution*, which possesses considerable powers of penetration, so that small masses (about the size of a pea) may be colored with it before being sectioned; and if it is diluted with six times its bulk of alcohol, they may be hardened at the same time, and will be ready for cutting in about 10 days.

Sections stained with the ammoniacal carmine should be washed, and then put into water slightly acidulated with glacial acetic acid (2 minims to the ounce), so as to fix the carmine.

Beale's fluid is thus prepared:—

Carmine, 10 grains.
Liq. Amm. Fort. 30 minims.
Glycerine, 2 oz.
Distilled Water, 2 oz.
Sp. Vini Rect. ½ oz.

Dissolve the carmine in ammonia, boil for a few seconds, add the water, filter; finally, add the glycerine and spirit, and keep in a stoppered bottle. Beale says, "Let the excess of ammonia pass off;" but this is unnecessary, as the excess is very slight.

Beale's stain, reduced with eleven times its bulk of water, produces good results in from 12 to 48 hours.

The *borax carmine* is thus prepared:—

1. Carmine, ½ drachm.
2. Borax, 2 drachms.
3. Distilled Water, 4 oz.

Place 1 and 2 dry in a mortar, and mix; then dissolve in warm water for 24 hours; after which pour off the supernatant fluid, and the solution is ready for use.

The *acid carmine fluid of Schweiggerseidel* is also useful in some cases, though Schäfer's acid logwood, already noticed, is preferable.

So far we have had to do only with stains that change but little, if at all. Those which we now come to, however, do change materially, *i. e.*, get rapidly darker and more opaque, till they reach a stage when they are utterly useless. They differ from all the others, with the exception of molybdate of ammonia, in the fact that the action of light is necessary to produce the color.

Nitrate of silver, which was introduced by Recklinghausen, is used in a half per cent. aqueous solution. Spe-

cimens to be acted upon should be dipped in distilled water to remove any trace of sodium chloride, and then steeped in the silver solution for some two or three minutes, after which they should be washed in ordinary water till it ceases to turn milky; then placed in glycerine and exposed to the action of light, until they assume a dark brown color, when they may be mounted in glycerine or glycerine jelly.

By means of this stain the endothelial cells of the lymphatics, bloodvessels, etc., and the nodes of Ranvier in medullated nerves, are rendered evident. They may subsequently be stained with logwood, carmine, or chloride of gold.

Many methods have been adopted for staining with *gold chloride*. I may mention three: Dr. Klein's, Dr. C. Bastian's, and Mr. Schäfer's.

1. Dr. Klein's method for showing the nerves in the cornea is as follows: Remove the cornea within 15 minutes of death; place it in a half per cent. chloride of gold solution for half an hour to an hour and a half or more; wash in distilled water, and expose to the light for a few days, the water being occasionally changed. Then place in glycerine and distilled water, in the proportion of one to two; subsequently place it in water, and brush gently with a sable pencil to remove any precipitate, when it may be mounted in glycerine. The cornea should now be of a gray violet tint.

Dr. Charlton Bastian's method is as follows: Place the sections or portions of tissue in gold chloride, 1 part; distilled water, 2000 parts, acidulated with strong hydrochloric acid (drop 1 to water $2\frac{1}{2}$ oz.). Let them remain protected from light for an hour, then remove and place them in acidulated water, half the strength of the above, and then transfer to a watch glass containing equal parts

of formic acid, and alcohol (90 p.c.). They should be stained in about half an hour.

Or, if it is desired to produce the stain more rapidly, use chloride of palladium, 1 part, water of palladium, 500 parts, where they should remain five or ten minutes; then wash in acidulated water, transfer to the formic acid and alcohol, as before, and mount.

Mr. Schäfer's method is the use of the double chloride of gold and potassium. 1. Place the fresh tissue in bichromate of ammonia (1–2 per cent. in water) solution for fifteen or twenty days. 2. Dip the sections, after being cut, into water, 1000 parts, double chloride of gold and potassium, 1 part. 3. Wash in hydrochloric acid, 1–2 parts, water, 3000 parts. 4. Then immerse for ten minutes in hydrochloric acid, 1 part, 60 p. c. solution of alcohol, 1000 parts; transfer to absolute alcohol; clear with oil of cloves; mount in balsam or dammar.

In staining with gold chloride or silver nitrate, Mr. Schäfer has found that, if the material after immersion in these stains be dipped into alcohol, the reduction of the metals is thereby greatly facilitated.

Osmic acid, which was first used by Schultze, is useful for the demonstration of fatty matters, which are thereby colored black; it is also valuable for some nerve preparations, but it is very irritating to the mucous membranes of the experimenter, and should be used with care. Specimens should be allowed to remain in a 1–2 per cent. aqueous solution of the acid from a quarter to twenty-four hours, when the stains will be complete; but if it is desired to harden also by its means, they should remain in it for some days. Osmic acid does not penetrate deeply, therefore small portions should be selected for its action.

Chloride of palladium, also introduced by Schultze, is used to stain and harden the retina, crystalline lens, etc.,

and other tissues, but cornified fat and connective tissues remain uncolored. Dissolve: Chloride of palladium, 1 part, in water of palladium, 1000 parts. An ounce of this solution will harden a piece of tissue, the size of a bean, in two or three days, staining it at the same time a brown or straw color. Specimens may be mounted in glycerine at once, or may be further stained with carmine.

Before proceeding to the double stains, it will be well to mention *Schäfer's silver nitrate and gelatine solution* for demonstrating lung epithelium. Take of gelatine 10 grms., soak in cold water, dissolve, and add warm water to 100 c.c. Dissolve a decigramme of nitrate of silver in a little distilled water, and add to the gelatine solution. Inject this with a glass syringe into the lung until distension is pretty complete. Leave it to rest in a cool place until the gelatine has set; then cut sections as thin as possible, place them on a slide with glycerine, and expose to light until ready for examination.

Of the *double stains* I will specially notice only those where the double color is produced by a single process. Of those in which the one color is first employed, and then the other, I will simply state which is to be used first, as all further particulars have been already given.

Those which are used in a single fluid are picro-carmine, carmine and indigo carmine, anilin blue, and anilin red.

Picro-carmine, which was first employed by Ranvier, has been used and prepared in several ways, but perhaps the best is Schäfer's, viz.: 1. Add to a saturated solution of picric acid in water a strong solution of carmine in ammonia to saturation. 2. Evaporate the mixture to one-fifth its bulk over a water bath, allow to cool, filter from deposit and evaporate to dryness, when picro-carmine is

left as a crystalline powder of red-ochre color. Sections should be stained in a 1 per cent. aqueous solution, requiring ten minutes for a good result; they should then be washed with distilled water, and mounted in glycerine. If it be desired to preserve them in balsam, after staining, transfer direct to alcohol methylated, then to absolute alcohol, after which they may be cleared in oil of cloves or benzole, and then mounted.

Carmine and indigo carmine, adopted by Merbel, give a bluc and red stain, and are said to be extremely selective. To prepare the Red Fluid, take: Carmine ½ oz., borax 2 drachms, water, distilled, 4 oz. For the Blue Fluid, take: Indigo carmine 2 drachms, borax 2 drachms, water, distilled, 4 oz. Mix each in a mortar, and allow to stand, then pour off the supernatant fluid.

1. If the sections have been hardened in chromic acid, picric acrid, or a bichromate, they should be washed in water till no tinge appears.
2. Place them in alcohol, then
3. For fifteen or twenty minutes, in the two fluids mixed in equal parts, after which
4. Wash them in a saturated aqueous solution of oxalic acid, where they should remain a rather shorter time than in the staining fluids.
5. When sufficiently bleached, wash them in water, to get rid of oxalic acid, then
6. They may be passed through spirit and oil of cloves, and be mounted as usual in balsam.

For Staining Blue and Red by Means of Anilin Dyes the best method is that which Mr. Gilburt recommends for staining plant sections. Dissolve: For Red, ¼ gr. Magenta crystals, in 1 oz. Alcohol. For Bluc: Then 1-6 gr. Nichol-

son's soluble pure blue, in 1 oz. alcohol, to which have been added 2 minims nitric acid. Both solutions should then be filtered. Use 2 minims of the blue to 7 minims of the magenta, and thoroughly mix. Place the section in the mixture for about one minute, then remove to absolute alcohol, from that of oil of cloves or benzole, and finally mount in balsam and benzole. To fix the magenta, it is usually necessary to pass the sections through benzole.

Cements, etc.

For balsam or glycerine jelly mounts, almost any varnish will do; but for fluids or glycerine it is necessary to have one that is tough, and most likely to prevent leakage; for this purpose, the following answer very well:—

1. *Mastic and Bismuth.*—Dissolve gum mastic in chloroform, and thicken with nitrate of bismuth. The solution of mastic should be nearly saturated.

2. *Oxide of Zinc, Dammar, and Drying Oil.*—Rub up: Oxide of zinc, well ground, 2 oz., with drying oil to consistence of thick paint. Then add an equal part of gum dammar, dissolved in benzole, to thickness of syrup. Strain through close-meshed muslin. Keep in well corked bottles, and, if necessary, thin with benzoline.

3. *Mr. Kitton's Cement.*—White lead in powder, red lead in powder, litharge powder, equal parts. Grind together with a little turpentine until thoroughly incorporated, and then mix with gold size. The mixture should be thin enough to use with a brush, and in use one coat should be allowed to dry before applying another. The mixture may be kept in a bottle, but no more *cement* should be made (*i. e.*, should be mixed with gold size) than required for immediate use, as it sets quickly and becomes unworkable.

Certain precautions are necessary to be observed in varnishing fluid or glycerine preparations; they are—

1. Use no more glycerine or fluid than is just necessary to fill up the space beneath the cover.

2. If the medium should escape beyond the cover glass, soak it up with a piece of blotting paper, being careful not to press the cover, or the cement will run in afterwards.

3. Wash the slide round the cover and the edge of the cover glass also, if necessary, with a sable pencil; then run a ring of cement on the slide just beyond the edge of the cover, a second round the edge of the cover, and a third bridging over the space between the two.

4. Three or four coats should thus be put on, taking care on each occasion that the previous coat is dry.

Of *preservative mounting media*, the most useful are balsam, glycerine, and glycerine jelly.

Canada balsam should be exposed to heat until it becomes quite brittle, allowed to cool, then it should be dissolved in benzole till as thin as glycerine, and should always be used cold.

Glycerine.—Specimens which have been hardened in chromic acid or bichromates may be mounted in pure glycerine alone; but if they have been hardened in spirit, glycerine and carbolic acid (in the proportion of glycerine 15 parts to carbolic acid 1 part) is better, as it is less refractive, and prevents the sections becoming granular.

For carmine-stained preparations it is well to add a trace of acetic acid to the glycerine (2 minims to the ounce).

Glycerine jelly is a good medium, as it offers the advantages of glycerine without the chance of leaking, but it is rather difficult to prepare, and therefore had better be

bought. A jelly composed of glycerine, gelatine, equal parts, is very useful; the glycerine should be warmed, and the gelatine (Nelson's) be allowed to dissolve in it.

Acetate of potash in a saturated solution is used for some preparations, but is liable to leak. The same may be said of Goadby's fluid.

Summary.

To summarize the whole of this paper:—

1. Let the material be quite fresh.

2. Take care that the hardening or softening fluid is not too strong. Use a large bulk of fluid in proportion to the material. Change the fluid frequently. If freezing be employed, take care that the specimen is thoroughly frozen.

3. Always use a sharp razor. Take it with one diagonal sweep through the material. Make the sections as thin as possible, and remove each one as soon as cut, for if sections accumulate on the knife or razor, they are sure to get torn.

4. Do not be in a hurry to stain, but remember that a weak coloring solution permeates the section better, and produces the best results; and that the thinner the section is, the better it will take the stains.

5. Always use glass slips and covers free from scratches and bubbles, and chemically clean. Never use any but extra thin circular covers, so that the specimens may be used with high powers. Always use cold preservatives, except in the case of glycerine jelly, and never use warmth to hasten the drying of balsam or dammar, but run a ring of cement round the cover.

6. Label the specimens correctly, and keep them on the flat and in the dark.

DIETETIC
PREPARATIONS AND PRECEPTS.

DIGESTIBILITY OF ALIMENTARY SUBSTANCES.

Few practitioners have made a careful study of aliments, considered individually or in their relations to one another. Even the relative composition of the various articles of food is to most of them an unknown quantity; and yet nothing is more important to the medical attendant on the sick than the knowledge judiciously applied of the principles of dietetics. With a proper appreciation of the amount of albuminous, starchy, saccharine, or oleaginous matters in each article of diet which his patient may employ, he will be much more competent to suggest the appropriate course to be pursued as supplementary to a rational medical treatment.

The following tables will at once give an insight into the digestibility of a large number of articles of food in common use, showing the various grades of easy, moderately easy, or difficult digestion; a comparison between animal and vegetable aliments in these respects; the elementary composition of the chief articles, etc.

Composition of Various Articles of Food (in 100 parts).[1]

	Water.	Albumen, etc.	Starch.	Sugar.	Fat.	Salts.
Bread	37	8.1	47.4	3.6	1.6	2.3
Biscuit	8	15.6	73.4		1.3	1.7
Wheat flour . .	15	10.8	66.3	4.2	2.0	1.7
Barley meal . .	15	6.3	69.4	4.9	2.4	2.0
Oatmeal . . .	15	12.6	58.4	5.4	5.6	3.0
Rye meal . . .	15	8.0	69.5	3.7	2.0	1.8
Indian corn meal .	14	11.1	64.7	0.4	8.1	1.7
Rice	13	6.3	79.1	0.4	0.7	0.5

[1] From estimates by Letheby and Parkes, in Treatise on Food and Dietetics, by F. W. Pavy, p. 427, Phila., 1874.

	Water.	Albumen, etc.	Starch.	Sugar.	Fat.	Salts.
Peas . . .	15	23.0	55.4	2.0	2.1	2.5
Arrowroot . .	18	......	82.0	....	...	...
Potatoes . .	75	2.1	18.8	3.2	0.2	0.7
Carrots . . .	83	1.3	8.4	6.1	0.2	1.0
Parsnips . .	82	1.1	9.6	5.8	0.5	1.0
Turnips . . .	91	1.2	5.1	2.1	...	0.6
Cabbage . .	91	2.0	5.8		0.5	0.7
Sugar . . .	5	......	......	95.0	...	...
Treacle . . .	23	......	......	77.0	...	...
New milk . .	86	4.1	......	5.2	3.9	0.8
Cream . . .	66	2.7	......	2.8	26.7	1.8
Skim milk . .	88	4.0	......	5.4	1.8	0.8
Buttermilk . .	88	4.1	......	6.4	0.7	0.8
Cheese . . .	36.8	33.5	......	...	24.3	5.4
Cheddar cheese .	36	28.4	......	...	31.1	4.5
Skim cheese . .	44	44.8	......	...	6.3	4.9
Lean beef . .	72	19.3	......	...	3.6	5.1
Fat beef. . .	51	14.8	......	...	29.8	4.4
Lean mutton . .	72	18.3	......	...	4.9	4.8
Fat mutton . .	53	12.4	......	...	31.1	3.5
Veal . . .	63	16.5	......	...	15.8	4.7
Fat pork . .	39	9.8	......	...	48.9	2.3
Green bacon . .	24	7.1	......	...	66.8	2.1
Dried bacon . .	15	8.8	......	...	73.3	2.9
Ox liver . .	74	18.9	.....	...	4.1	3.0
Tripe . . .	68	13.2	......	...	16.4	2.4
Cooked meat, roast, no dripping being lost; boiled meat assumed to be the same . . .	54	27.6	......	...	15.45	2.95
Poultry . . .	74	21.0	......	...	3.8	1.2
White fish . .	78	18.1	......	...	2.9	1.0
Eels . . .	75	9.9	.....	...	13.8	1.3
Salmon . . .	77	16.1	......	...	5.5	1.4
Entire egg . .	74	14.0	......	...	10.5	1.5
White of egg. .	78	20.4	......	...	...	1.6
Yolk of egg . .	52	16.0	......	...	30.7	1.3
Butter and fat .	15	......	......	...	83.0	2.0
Beer and porter .	91	0.1		8.7	...	0.2

Another useful but less scientific classification of alimentary substances, is that which arranges them into the three groups mentioned in the following summary, according to their relative digestibility. The practitioner,

in special cases, where more minute information is needed, may supplement this table by data derived from works particularly devoted to dietetics.[1]

Easy of Digestion.	Moderately Digestible.	Hard to Digest.
Mutton.	Beef.	Pork.
Venison.	Lamb.	Veal.
Hare.	Rabbit.	Goose.
Sweetbread.	Young pigeon.	Liver.
Turkey.	Duck.	Heart.
Chicken.	Wild waterfowl.	Brain.
Partridge.	Woodcock.	Salt meat.
Pheasant.	Snipe.	Sausage.
Grouse.	Soups.	Hashes.
Beef-tea.	Eggs.	Mackerel.
Mutton broth.	Butter.	Eels.
Milk.	Turtle.	Salmon.
Turbot.	Cod.	Herring.
Haddock.	Pike.	Halibut.
Flounder.	Trout.	Salt fish.
Sole.	Raw or stewed oysters.	Lobster.
Fresh fish generally.	Potatoes.	Crabs.
Roasted oysters.	Beets.	Shrimps.
Stale bread.	Turnips.	Muscles.
Rice.	Cabbage.	Oil.
Tapioca.	Spinach.	Melted butter.
Sago.	Artichoke.	Raw eggs.
Arrowroot.	Lettuce.	Cheese.
Asparagus.	Celery.	Fresh bread.
Sea kale.	Apples.	Muffins.
French beans.	Apricots.	Buttered toast.
Cauliflower.	Currants.	Pastry.
Baked apples.	Raspberries.	Cakes.
Oranges.	Bread.	Custards.
Grapes.	Farinaceous puddings.	Nuts, pears, plums.
Strawberries.	Jelly.	Cherries, pineapples.
Peaches.	Marmalade.	Cucumbers, onions.
Toast-water.	Rhubarb plant.	Carrots, parsnips.
Black tea.	Cooked fruits.	Peas, beans, mushrooms.
Sherry.	Cocoa.	Pickles.
Claret.	Coffee.	Chocolate.
Ale.	Porter.	Champagne.

The following tables, exhibiting the relative digestibility of animal and of vegetable substances, are self-explanatory, the mode of cooking of each article being

[1] Dr. H. Hartshorne's Essentials of the Principles and Practice of Medicine, p. 224, Phila. 1874.

given, as well as the time necessary for chymification. These facts are so constantly essential to the well-being of the patient, and to satisfactory treatment by the practitioner, that but little further comment is necessary.

Relative Digestibility of Animal Substances.[1]

Article of diet.	How prepared.	Time of chymification.	
Pigs feet (soused)	Boiled	1^h	0^m
Tripe "	Boiled	1	0
Eggs (whipped)	Raw	1	30
Salmon trout	Boiled	1	30
Venison steak	Broiled	1	30
Brains	Boiled	1	45
Ox liver	Broiled	2	0
Codfish (cured dry)	Boiled	2	0
Eggs	Roasted	2	15
Turkey	Boiled	2	25
Gelatin	Boiled	2	30
Goose	Roasted	2	30
Pig (sucking)	Roasted	2	30
Lamb	Broiled	2	30
Chicken	Fricasseed	2	45
Beef	Boiled	2	45
Beef	Roasted	3	0
Mutton	Boiled	3	0
Mutton	Roasted	3	15
Oysters	Stewed	3	30
Cheese	Raw	3	30
Eggs	Hard boiled	3	30
Eggs	Fried	3	30
Beef	Fried	4	0
Fowls	Boiled	4	0
Fowls	Roasted	4	0
Ducks	Roasted	4	0
Cartilage	Boiled	4	15
Pork	Roasted	5	15
Tendon	Boiled	5	30

A similar tabular arrangement of vegetable aliments may also be made.

[1] H. Letheby, Lectures on Food, 2d edition, London, 1872, p. 56.

Relative Digestibility of Vegetable Substances.[1]

Article of diet.	How prepared.	Time of chymification.
Rice	Boiled	1h 0m
Apples (sweet and mellow)	Raw	1 30
Sago	Boiled	1 45
Tapioca	Boiled	2 0
Barley	Boiled	2 0
Apples (sour and mellow)	Raw	2 0
Cabbage with vinegar	Raw	2 0
Beans	Boiled	2 30
Sponge cake	Baked	2 30
Parsnips	Boiled	2 30
Potatoes	Roasted	2 30
Potatoes	Baked	2 33
Apple dumpling	Boiled	3 0
Indian corn cake	Baked	3 0
Indian corn bread	Baked	3 15
Carrot	Boiled	3 15
Wheaten bread	Baked	3 30
Potatoes	Boiled	3 30
Turnips	Boiled	3 30
Beets	Boiled	3 45
Cabbage	Boiled	4 0

DIETETIC PREPARATIONS FOR THE SICK.

The practitioner is frequently appealed to for instructions, not only as to the nature of the diet appropriate for his patient, but also as to the precise manner in which it should be prepared, to be at once palatable, nutritious, and continuously serviceable. Not having familiarized himself with the simplest principles of cookery, he is sometimes at a loss to know what suggestion to make, or what advice to offer, in order to insure the greatest attainable perfection of culinary effort. At any moment he may be called upon for his views as to the best methods of preparing even the most ordinary dietetic articles for

[1] Letheby, op. cit., p. 58.

the sick-room, such as beef-tea, mutton broth, flaxseed tea, etc.; and he should also be able to suggest, in convalescence, the use of other substances, that may form an essential feature in the recovery of his patient.

With the view of assisting the practitioner in this channel, which is too frequently left to the unskilled and uninstructed, the following useful recipes and suggestions are offered. An alphabetical arrangement is adopted, rather than any systematic attempt at classification, so that the practitioner may at once find the article when most needed.[1] It will be, of course, his duty to decide which of these articles are adapted for patients who may be seriously sick, as distinguished from those which may be taken, almost with impunity, by convalescents.

Almond Emulsion.

Beat an ounce and a quarter of blanched sweet almonds with five drachms of white sugar in a porcelain mortar into a smooth pulp, gradually adding a quart of soft water, and stirring actively until the whole is mixed. Strain through linen.

An agreeable demulcent drink.

Alum Whey.

Add a quarter of an ounce of powdered alum to a pint of boiling milk, and strain; flavor with sugar and nutmeg, if desired.

A useful astringent drink.

[1] Some of the palatable preparations here given are obtained from manuscript recipes of excellent housekepers. Others are derived from works on dietetics, especially that of Pavy, already referred to; from Florence S. Lees's "Handbook for Hospital Sisters;" and from several standard works on cookery, whose object is to give the most reliable information on this subject. The most desirable recipes from a large mass of such material have been selected for insertion here.

Apple Barley Water.

Add half a pound of apples, cut in slices, with the skin on and the pips removed, to a pint of barley water. Add sliced lemon, boil gently until done, and pass through a colander.

A cooling drink in febrile affections.

Apple Water.

Carefully roast three good tart apples, preserve the juice, put in a quart pitcher, pour on it about a quart of boiling water, cover, and drink when cold.

An agreeable drink may also be made by baking an apple over which a teaspoonful of brown sugar has been sprinkled, adding toast water (see p. 297) to it when browned, and flavoring with orange or lemon-peel.

A pleasant drink in fevers, etc.

Arrowroot.

Mix two teaspoonfuls of arrowroot with three tablespoonfuls of cold water, and pour on them half a pint of boiling water, keeping it well stirred. If the water be merely warm, the arrowroot must afterwards be boiled until it thickens. Add sugar, and flavor with lemon-peel or nutmeg, or add sherry or brandy if required. If milk is used instead of water, wine must be omitted, as it will curdle the milk.

A nutritive preparation for convalescents especially.

Arrowroot Pudding.

Mix a tablespoonful of arrowroot with cold water, put it over the fire in a porcelain-lined saucepan, add a pint of boiling milk, stirring constantly, and one egg well beaten with a tablespoonful of white sugar; let it boil for five or ten minutes. If a baked pudding is preferred,

it may be mixed in the same way and baked in a moderately quick oven for twenty or thirty minutes.

May be taken in the early periods of convalescence.

Arrowroot Water.

Mix well in a pan three ounces of arrowroot, two of white sugar, peel of half a lemon, quarter of a teaspoonful of salt, two quarts of water; set on the fire and boil for a few minutes. Use either hot or cold.

A nutritious drink in diarrhœa, fevers, etc.

Barley Gruel.

Wash two ounces of pearl barley, boil in a quart of water till reduced to a pint; strain, add a little sugar and three wineglassfuls of port wine, or milk if the wine be contraindicated, and heat it up before using.

For convalescents and anæmic patients.

Barley Soup.

Add a pint of boiling water and a small quantity of salt and sugar to half a cupful of good washed pearl barley, put into an earthenware pot with a piece of butter about the size of a nut, and a piece of fine cinnamon. Cook over a slow fire until soft, strain through a fine hair sieve. Stir the beaten yolk of an egg into the soup. Add more boiling water while cooking if necessary.

Barley Water.

Wash two ounces of pearl barley well with cold water, throwing away the washings. Boil with a pint and a half of water for twenty minutes in a covered vessel and strain. Sweeten and flavor with lemon-peel or lemon juice.

Another agreeable formula—for a compound barley water—is to put two ounces of pearl barley well washed

in cold water into half a pint of boiling water; let it stand for five minutes, pour it off, add three pints of boiling water, a little salt, half a dozen nice figs sliced, a handful of cut raisins, and a small stick of liquorice; let this simmer for fifty minutes, strain, and add a little sweetening if necessary.

A diluent and moderately nutritious drink.

Barley Wine (Aromatic).

Boil a quart of barley water down to a third; add while hot a pint of sherry, a drachm of tincture of cinnamon, and an ounce of refined sugar.

To a convalescent, a wineglassful may be given two or three times daily.

Beef Broth.

Take a pound of lean beef, some sweet herbs, put in a saucepan with two quarts of water, simmer to one quart. Let it stand until cold, skim off the fat carefully; if small particles should remain, lay a piece of clean blotting-paper on the broth, in order to remove them.

A simple restorative after acute disease.

Beef, Raw.

Take half a pound of juicy beef, free from any fat; mince it very finely; then rub it into a smooth pulp either in a mortar or with an ordinary potato masher, and press it through a fine sieve. Spread a little out upon a plate and sprinkle over it some salt, or some sugar if the child prefers it. Give it alone or spread upon a buttered slice of stale bread.

This is an excellent food for children with dysentery, and also for adults.

Another formula for its preparation is recommended in France :—[1]

The fat should be removed (one reason being that it may contain cysticercus). The best part is the rump steak. The fibres are here best suited for rasping in longitudinal direction. This is the best mode of preparing it, as chopping removes from the meat most of its juice, and does not give such good division. The rasping is done with a sharp knife-blade—the sharper the better. The piece of meat should be pretty thick, and of lozenge shape; the rasping can be done on all the facings, in the natural direction of the muscular fibre. The meat is generally reduced to the form of a pill or bolus, which is rolled in powdered sugar on crumbs of bread. If it cannot be taken thus, it may be given under the mask of cold bouillon. One of the best methods is to prepare a thin porridge of tapioca; let it cool until it cannot cook the meat in the least. Then the meat, finely rasped, is introduced into a small quantity of the cold soup till the mixture is complete, having the aspect and consistence of a fine soup of tomatoes. Next the tapioca porridge is gradually poured on this soup, the mixture being constantly stirred.

Beef Tea.

It should be borne in mind that prolonged boiling or simmering produces a broth instead of a tea, destroying the flavor and nutrient power. All that is needed is to heat the cold infusion to about 170° Fahr., which is just sufficient to coagulate the albumen and coloring matter, and thus deprive the product of its character of rawness.[2] Being so important a dietetic agent, several formulæ are given for its manufacture.

[1] New Remedies, 1876. [2] Pavy, op. cit.

The most agreeable and nutritive form of beef-tea is made as follows:—

1. Mince finely one pound of lean beef, and pour upon it, in a preserve jar, or other suitable vessel, one pint of cold water. Stir, and allow the two to stand for about an hour, that the goodness of the meat may be dissolved out. Next, stand the preserve jar or other vessel in a saucepan of water, and place the saucepan over the fire or a gas-stove, and allow the water in it to gently boil for an hour. Remove the jar, and pour its contents on a strainer. The beef tea which runs through contains a quantity of fine sediment, which is to be drunk with the liquid, after being flavored with salt at discretion.

2. *Liebig's Beef-tea.*—On half a pound of raw lean beef (or chicken, etc.), finely minced, pour, in a glass or earthenware vessel, three-quarters of a pint of water containing three or four drops of muriatic acid, and half a saltspoonful of salt; stir well together and allow it to stand for an hour. Strain through a hair-sieve and rinse the residue with a quarter of a pint of water. The result is the juice of the meat with uncoagulated albumen, and muscle fibrin, which has been dissolved by the agency of the acid. It is to be taken cold, or, if warmed, must not be heated beyond 120° Fahr. No cooking will have been employed. Although much richer in nutritive material and more invigorating than ordinary beef-tea, the raw-meat color, smell, and taste, are to many an objection to its use.[1] (See Restorative Soup, p. 291.)

3. Take one pound of juicy lean beef—say a piece from the shoulder or the round—and mince it. Put it

[1] Pavy, op. cit.

with its juice into an *earthen* vessel containing a pint of tepid water, and let the whole stand for one hour. Then slowly heat it to the boiling-point, and let it boil for three minutes. Strain the liquid through a colander, and stir in a little salt. If preferred, a little pepper or allspice may be added.

Recommended for children by the Philadelphia Obstetrical Society.

4. Take a pound of lean, juicy beef, being sure to remove all skin and fat, cut in small squares, and place in a porcelain-lined saucepan with a pint of cold water. After soaking for an hour, put it over a slow fire and let it simmer for two or three hours, carefully skimming it occasionally, then boil quickly for a few minutes, when it may be strained and served. Salt and pepper may be added if desired.

Biscuit Jelly.

Pour a quart of boiling water over a two-ounce biscuit, boil until reduced one-half, strain, and stir in a little wine and half a pound of white sugar, simmer until reduced to half a pint, and set aside to cool.

Useful in debilitated conditions of the digestive organs.

Blanc Mange.

Pour half a pint of cool water on half an ounce of isinglass, put it near the fire to simmer until perfectly dissolved. In the mean time whip one pint of cream with rather less than three ounces of sugar to a stiff froth, flavoring with extract of lemon or vanilla. When the isinglass is quite soft and while lukewarm, pour the cream slowly in, beating constantly until stiff enough to drop from the spoon. Pour in moulds. Milk may be substituted for the water.

Bran Loaf.

Boil two quarts of wheat bran in sufficient water to well cover it, for five minutes, strain through a sieve, then add fresh water and boil ten minutes, strain through a sieve a second time, then pour cold water over it until the water runs through perfectly clear. Press the bran tightly in a cloth, making it as dry as possible, then spread thinly on a dish and put in a slow oven for several hours or over-night, and when dry and crisp it will be ready to grind. Grind very fine in a mill and sift through a fine wire sieve (a brush may be needed to pass it through). The bran must be soft and fine. Take three ounces of this bran powder, three eggs, an ounce and a half of butter, and a small teacupful of milk. Warm the butter in part of the milk, and mix the eggs well with the other portion, add a little nutmeg, and stir all well together. Just before putting in the oven stir in half a drachm of bicarbonate of sodium and three teaspoonfuls of hydrochloric acid. Bake in a well-buttered pan for an hour or more.

Valuable in the dietetic treatment of diabetes.

Bran-Flour Jelly.

Take half a pint of bran flour, moisten it with cold water, then stir it into a quart of boiling water, let it boil slowly for half an hour, stirring it almost constantly to prevent scorching, then pour through a coarse sieve into a mould; when cold turn it out, and eat with milk or cream, with a little sugar if desired.

Brandy and Egg Mixture.

(See *Egg Brandy*.)

Bread Jelly.

Toast lightly three or four slices of stale bread, removing the crust before toasting. Have ready in a porcelain-lined saucepan three pints of boiling water, lay the bread in it, along with the half of a small lemon thinly sliced; boil until it jellies, then strain and sweeten to the taste.

A useful food for infants about the period of weaning, for children suffering from acute affections, etc.

Bread and Milk.

Even the simplest dishes may be spoiled by not being properly cooked. Cut stale bread into small square pieces, put in a dish, let the milk boil, at which point pour it over the bread. Cover the dish closely for about ten minutes, when the bread will be well soaked and ready for use.

Bread Panada.

(See *Panada, Bread.*)

Calves'-Feet Jelly.

Take four calves' feet, wash and clean them carefully and put them in a saucepan with three quarts of cold water and a little salt; boil them down until reduced to half the quantity, then strain through a colander. When quite cold remove all the fat carefully, then put this jelly into a perfectly clean saucepan, adding sugar and sherry or Madeira wine to the taste, the rind of two fresh lemons peeled *thinly*, with their juice, and a small wineglassful of best brandy; let these simmer thoroughly for five minutes, then add the whites of five eggs beaten up with their shells, and stir constantly until it boils; let it boil slowly for twenty minutes, when it may be set aside ten or fifteen minutes to settle, after which it can be poured

through a strainer or jelly bag into moulds. It need not be stirred after it begins to boil, being careful not to have it over too strong a fire.

A valuable article in convalescence.

Carrageen Moss.

(See *Irish Moss.*)

Caudle.

Mix two spoonfuls of oatmeal in a quart of water, with a little lemon-peel thinly sliced; let it boil half an hour, stirring frequently, then strain and add sugar to the taste, a glass of white wine, and a little grated nutmeg.

A slightly stimulating and nutritious drink.

Chicken Broth.

Clean carefully a chicken weighing about one pound—an old one is the best for the purpose—if too heavy, take half, crack the bones in several places, add a little salt and put over the fire in a saucepan with a quart of water; a spoonful of rice may be added; boil very slowly for two hours, skimming it well and keeping the vessel tightly covered. Just before using, a little chopped parsley may be added.

Chicken Jelly.

After washing and cleaning a chicken break all the bones, put it into a stone jar closely covered, set the jar into a kettle of boiling water, keep it boiling three hours, strain, and season with salt and a very little mace, if desired. Replace the chicken in the jar, and boil again; it will produce as much jelly as before.

Chicken Panada.

Boil a chicken in a quart of water until nearly done, then take off the skin, cut the meat off when cold, and

put into a marble mortar if convenient; if not, roll it with a rolling pin and mix to a paste with a little of the water it was boiled in; season with salt and a little grated nutmeg; simmer gently for a few minutes to the desired consistence. It should be such as can be easily drunk, though reasonably thick.

A very nourishing article of diet in small bulk.

Chicken Tea.

Take the thigh and leg of a chicken, put in a covered saucepan with a pint of cold water, set it over the fire to simmer for twenty minutes, skim it well, add a little salt, and strain it when it is ready for use. A piece of toast bread cut in small pieces, with some of the boiling tea poured over it, is quite nutritious and palatable.

Cracker Panada.

(See *Panada, Cracker.*)

Crackers, Soaked.

(See *Toast, French.*)

Cream of Tartar Water (Imperial).

Pour a pint of boiling water over the thin peel of half a lemon, cover closely, let it stand for five minutes, then stir in a teaspoonful of cream of tartar; when quite cold sweeten to the taste.

A refrigerant and diuretic drink.

Cream of Tartar Whey.

Stir a large teaspoonful of cream of tartar into a pint of boiling milk, and strain.

A refrigerant and diuretic drink, made more palatable by the addition of sugar.

Egg Brandy.

Rub the yolks of two eggs with half an ounce of loaf sugar, and add four ounces each of brandy and cinnamon water.

A restorative and stimulant in doses of half a wine-glassful to a wineglassful, in the sinking stage of typhus and other adynamic fevers.

Egg Broth.

Take a tablespoonful of white sugar and the yolk of one egg, beat them well together, then pour on it, stirring constantly, half a pint of boiling sweet milk or water; add a tablespoonful of best brandy and a little grated nutmeg.

A still more nutritious broth may be made by stewing two ounces of well-washed pearl sago in half a pint of water, until it is tender and very thick; mixing with it the yolks of four fresh eggs, well beaten with half a pint of good boiling cream; mix the whole carefully into a quart of boiling beef-tea.

Useful in lingering convalescence, after acute disease.

Egg Flip.

Beat well together the yolks of four fresh eggs and the whites of two with two tablespoonfuls of white sugar, pour in boiling water, a little at a time until you have added a quart, finally throw in two tumblers of cognac brandy and one of old Jamaica rum. Wine may be used if preferred.

Egg Nogg.

Take the yellow of four eggs and three tablespoonfuls of pulverized sugar, and beat them to a cream, add a little nutmeg and beat well together; then mix in two ounces

of the best brandy and half a wineglass of Madeira wine; when this is well mixed, stir in a pint and a half of rich milk; have ready the whites of the eggs beaten to a stiff froth, and beat them in the mixture—when it is ready for use.

This preparation is not likely to cause headache, and is nourishing to the debilitated or consumptive.

Flaxseed Tea.

Pour a pint of boiling water over an ounce of whole flaxseed and quarter of an ounce of bruised liquorice root; cover lightly, digest for three or four hours near a fire, and strain through linen. Flavor with lemon if necessary.

A demulcent drink in pulmonary and urinary affections.

Flour Ball, or Flour, Boiled.

Take one quart of good flour; tie it up in a pudding-bag so tightly as to make a firm, solid mass; put it into a pot of boiling water early in the morning, and let it boil until bedtime. Then take it out and let it dry. In the morning, peel off from the surface and throw away the thin rind of dough, and, with a nutmeg-grater, grate down the hard dry mass into a powder. Of this from one to three teaspoonfuls may be used, by first rubbing it into a paste with a little milk, then adding it to about a pint of milk, and, finally, by bringing the whole to just the boiling point. It must be given through a nursing-bottle.

Useful in irritability of the stomach and bowels, and in dysentery and diarrhœa. Recommended for children by a committee of the Obstetrical Society of Philadelphia.

An excellent food for children who are costive may be

made by using bran-meal or unbolted flour instead of the white flour, preparing it as above directed.

Flour Caudle.

Mix a tablespoonful of flour with about five tablespoonfuls of water; set on the fire an equal quantity of new milk, slightly sweetened, and let it boil; pour it gradually over the flour and water; let them boil together for twenty minutes, constantly stirring.

Useful for infants with weak condition of the bowels.

Fruit Drinks.

Cherries, currants, or raspberries may be used. Put the fruit in a jar and set in a saucepan of water over the fire, let the water boil slowly until the fruit in the jar is well broken, giving out its juice freely; then pour through a strainer or jelly-bag, slightly pressing the fruit.

This juice sweetened and iced makes a pleasant cooling drink.

Goat's Milk (Artificial).

Boil an ounce of fresh suet, cut into small pieces, and tied in a roomy muslin bag, in a quart of milk, in which is dissolved a quarter of an ounce of white sugar candy.

Useful in the emaciation of scrofula and phthisis, and for infants raised with a spoon.

Gruel.

Mix a small tablespoonful of fine oatmeal or groats in two tablespoonfuls of cold water, add a pint of boiling water and a little salt, boil thirty minutes, stirring frequently. Sugar and nutmeg may be used, as also a small piece of butter.

Or, mix two spoonfuls of oatmeal in a little milk, stir this into a pint of boiling water. Simmer thirty minutes,

stirring frequently; strain, and add a little wine or brandy.

Gruel may also be made of fine grits or hominy, as follows: Take two or three tablespoonfuls of hominy after being boiled soft, rub well with butter until quite light, mixing in a half pint of boiled milk slowly to prevent the hominy becoming lumpy. Strain through a sieve or piece of muslin, then boil it, stirring well. Either sugar and nutmeg or salt can be used according to taste. Serve hot. Rice can be used instead of the grits, and prepared in the same way.

Gum Water.

This may be made simply by dissolving by maceration half an ounce or an ounce of gum Arabic, previously washed with water, in a quart of water, and adding lemon-peel to impart a flavor; or, by pouring a quart of boiling water on a mixture of quarter of a pound of white gum Arabic, the same quantity of rock candy, and a large thinly sliced lemon, constantly stirring, and kept in a warm place until the gum is dissolved.

A pleasant demulcent drink.

Ice for the Sick Room (to preserve).

Cut a piece of flannel, about eight inches square, and secure it by ligature around the mouth of an ordinary tumbler, so as to leave a cup shaped depression of flannel within the tumbler to about half its depth. In such flannel cup, ice may be preserved for many hours, and still longer if a piece of flannel three or four inches square be loosely laid over the ice-cup. Cheap, open mesh flannel is preferable, as the water easily drains through it, and thus keeps the ice quite dry.

Iceland Moss.

(See *Irish Moss.*)

Imperial Drink.

(See *Cream of Tartar Water.*)

Invalid's Lunch.

Put a layer of bread crumbs and a layer of jelly alternately in a tumbler until half full, then fill the tumbler with milk. Currant jelly or any slightly acid jelly is preferred.

Irish or Carrageen Moss.

Wash carefully half an ounce of moss in cold water, then put in a quart of water, boil gently for fifteen minutes, or until the consistence of warm jelly; strain and sweeten, or flavor with lemon or white wine. Milk may be used instead of water, by which a more nourishing liquid is obtained.

Iceland moss may be similarly prepared.

A nourishing demulcent article of diet.

Lemonade.

Slice a lemon thinly and put into a jug, with two ounces of white sugar, pour over them one pint of boiling water, cover closely and digest until cold, when the liquid may be strained or poured off.

Lemonade Jelly.

Slice very thinly three fresh lemons and two Seville oranges, pour over them a pint of boiling water, cover closely for half an hour; while the orange and lemon are steeping have one and a half ounces of isinglass soaking in half a cup of cold water; when quite soft put it in a porcelain-lined saucepan and pour over it the orange,

lemon, and water; let it simmer for fifteen minutes, stir in two tablespoonfuls of white sugar and half a pint of good wine; let it simmer two minutes, and strain through jelly-strainer or bag.

Lemon Drinks.

Take a lemon, and several lumps of white sugar; rub the sugar all over the outside of the lemon. Cut the lemon, and squeeze out all the juice; put the remains of the lemon and the juice on a sieve, and pour on it a pint or more of boiling water. When cold, sweeten with the sugar, according to taste.

Or, slice a lemon; put it into a jug, and pour on it a pint or more of boiling water. When cold, sweeten to taste.

Either of the above may be made to effervesce by the addition of a very little carbonate of soda. Under the head of Milk Lemonade (page 468) will be found another agreeable dietetic preparation, of which lemon is an important ingredient, peculiarly adapted to convalescents from low fevers or exhausting diseases.

Lemon Juice (Artificial).

Rub two ounces of citric or tartaric acid in a mortar with four drops of essence of lemons. Dissolve it in one and a half pints of boiling water. Keep corked. Dilute and sweeten when required for use.

Lemon-Peel Water.

Pare the rind from a lemon, being careful not to use any of the white or inner part of the rind. Put the peelings in a jug, and pour over them a pint of boiling water; cover closely, and when quite cold pour off the liquid, and add a tablespoonful of powdered white sugar; a tablespoonful of good brandy or sherry may be added.

A pleasant, cooling, astringent drink, when iced; given in diarrhœa, etc.

Lemon Syrup.

To two pounds of crushed white sugar put two pints of water and the juice of eight good lemons, with the thinly pared rind of three. First boil the sugar and water, skimming till clear; add the lemon-peel and unstrained juice, boiling ten minutes longer. Strain the syrup while hot; bottle. It will keep indefinitely, and will make good lemonade at any time, and is inexpensive.

Lemon Tea.

Make tea in the ordinary way, but not very strong. When sufficiently drawn, pour it while as hot as possible into a jug, and for every half pint of tea put in one excessively thin slice of a small lemon, or half a slice of a large one. In ten minutes sweeten to taste, strain, and allow it to get cold. It may be taken hot if preferred.

Liebig's Food for Infants.

(See *Dietetic Treatment of Infants*, p. 236.)

Macaroni and Milk.

Soak two or three pieces of macaroni in a pint of warm milk for twenty minutes, or until soft; add a little salt and boil gently for twenty minutes or half an hour. May be flavored with cinnamon or nutmeg.

Macaroni Pudding.

Simmer two ounces of carefully washed macaroni in a pint of milk and a teacupful of water. Beat up the yolks of three eggs and the white of one egg with an ounce of white sugar, and half a pint of milk, and a few drops of essence of lemon; when the macaroni is quite tender add the mixture and bake in a slow oven.

An agreeable article in convalescence.

Macaroni Soup.

Boil a quart of beef-tea until reduced to two-thirds, add two ounces of well-cooked macaroni, and boil down to a pint. Season to the taste.

A pleasant soup for convalescents.

Marshmallow Tea.

Add two ounces of dried marshmallow root and one ounce of Sultana raisins, to two and a half pints of boiling water; boil slowly until reduced one-half. Strain without pressure.

An excellent demulcent drink in renal disease, with a tendency to gravel.

Milk and Egg.

Add a pint of good milk to a well-beaten fresh egg, a pint of cold water, and salt to make it palatable; let it come to a boil quickly (if heated slowly it is apt to curd, and if so it is useless), stirring all the time; as soon as it comes to a boil it is cooked sufficiently.

Can be given in all forms of sickness of the stomach, and an admirable drink for infants suffering with choleraic diarrhœa.

Milk Lemonade.

Dissolve half a pound of loaf sugar in a pint of boiling water, add a teacupful of good sherry wine and the same quantity of lemon juice freshly pressed from the fruit; mix well, then add a pint of cold milk; stir well together and pass through jelly-strainer or bag without pressure.

Milk and Soda Water.

Heat a teacupful of milk almost to boiling, dissolve in it a teaspoonful of white sugar; pour into a large tumbler, and add two-thirds of a bottle of good soda water.

Useful in acid conditions of the stomach, when milk alone will disagree.

Milk Porridge.

Stir two tablespoonfuls of oatmeal into a pint of milk, then stir quickly into a pint of boiling water, and boil until it thickens, stirring constantly.

Milk Punch.

Mix well together a tablespoonful of white sugar, two tablespoonfuls of water, a wineglassful of good brandy, and half a wineglassful of rum ; pour in a large tumbler, add some small pieces of ice, and fill the tumbler with milk; stir well and grate a little nutmeg over the top.

Mint Tea.

Put a few mint leaves (fresh or dried) in a pint of boiling water, cover and stand near the fire for an hour.

To be used in febrile and other complaints. When made of the fresh leaves it relieves vomiting.

Mustard Whey.

Boil one quart of milk with an ounce of bruised mustard seeds, until the milk curdles; strain to separate the whey.

Useful in dropsy as a urinary stimulant.

Mutton Broth, or Tea.

Take three or four ribs out of the loin of a piece of mutton, remove all the fat, break the bones and put into a covered saucepan with a quart of cold water, and a little salt; cook slowly for an hour and a half or two hours, being careful to skim off all the fat which may rise; pour off the broth from the pieces of mutton, and it is ready

for use. A tablespoonful of rice may be added half an hour before the broth is removed from the fire.

This is an agreeable change after a patient becomes tired of beef-tea.

Oatmeal Gruel.

(See *Gruel.*)

Oatmeal Porridge.

Mix two tablespoonfuls of oatmeal with three tablespoonfuls of cold water; stir into a pint of boiling water; boil for three-quarters of an hour. To be eaten with a little salt and butter, or sugar and milk.

Good to relieve constipation, where there is no dyspeptic tendency.

Orange Jelly.

Melt a quarter of a pound of sugar in some hot water, and pour it over five ounces of orange juice previously pressed from fine ripe fruit. In the mean time have three-quarters of an ounce of gelatine melted in a little water, and add to the syrup; boil for two minutes.

Orange Water.

Pour a quart of water over the juice of six oranges and two lemons; cover for ten minutes, sweeten, and serve iced.

A pleasant, cooling drink.

Oyster Soup.

Drain one pint of oysters through a colander for five minutes; remove the liquor, and then pour over them one pint of boiling water, which must be thrown aside. Add to the liquor already drained a pint of boiling water, and put over the fire in a porcelain-lined saucepan, boil until all the scum has risen and been skimmed off; then

add half a pint of fresh milk, one water cracker rolled to a powder, a piece of butter, and a little salt and pepper. Boil ten minutes, and just before the soup is to be served, turn in the oysters from the colander and let them scald for three minutes.

Oysters cooked in this way are not apt to give discomfort, and are therefore adapted to invalids.

Panada, Bread.

Put two slices of stale bread in a covered bowl with a little more than enough hot water to cover them, and let them soak for ten or fifteen minutes, then add two spoonfuls of sweet milk and a little white sugar; boil for ten minutes, stirring constantly.

Five minute panada may be made by mixing in a coffee cup of hot water, a glass of wine, a dessertspoonful of white sugar, and a little nutmeg. Set over the fire to boil. Have ready some grated bread crumbs, and the moment the mixture boils, stir the crumbs in rapidly, and continue stirring until it has boiled to a proper thickness. *Cream panada* is made by adding cream.

Panada, Chicken.

(See *Chicken Panada.*)

Panada, Cracker.

Break three or four water crackers (Trenton crackers are the best) in a bowl with half a pint of boiling water, cover and let stand until the crackers are quite soft, then serve with a little sugar and grated nutmeg. A dessertspoonful of wine may be added.

Quince Water.

Take the cores of six or eight quinces or a few slices of dried quinces and pour over them a pint of boiling

water, simmer for ten minutes, cover tightly, and when cold, strain.

An acceptable mucilaginous drink.

Raspberry Vinegar.

Mix a quart of raspberries with a quart of best cider vinegar, let them stand for a week, stirring occasionally, then add one pound of loaf-sugar, boil slowly twenty minutes, strain and bottle.

Raw Beef.

(See *Beef*, *Raw*.)

Rennet Whey.

Steep a piece of rennet in a pint of boiling water or less, according to the size of the rennet; separate the fluid, and stir a dessertspoonful of it into a quart of milk; cover with a cloth, and place near the fire until it curds. Divide the curd with a spoon to separate the whey, which should be quite clear, and of a sweetish taste.

An excellent diluent in febrile affections.

Restorative Soup.

The following modification of Liebig's formula for beef-tea is suggested by Dr. Tanner. Chop finely half a pound of fresh beef or chicken, add four fluidounces of soft or distilled water, two or three drops of pure hydrochloric acid, fifteen or thirty grains of common salt, and stir well together. After two hours the whole is to be thrown on a hair sieve, and the fluid allowed to pass through with slight pressure. On the residue in the sieve pour slowly one ounce of distilled water, and let it run through while pressing the meat. About five fluidounces of cold red juice will thus be obtained, having a pleasant soup taste, of which a wineglassful can be taken

at pleasure. It must not be warmed, as the albuminous portion will be deposited. Spice or a little claret may be added, if desirable to modify the taste. If the acid be contraindicated, the soup may be prepared by merely soaking the minced meat in plain distilled water. The minced meat may also be given alone, one part to two parts of sugar, to children.

A valuable dietetic preparation in continued fever, dysentery, and adynamic conditions generally.

Rice (Baked).

Prepare as in boiled rice, and when nicely done, place in the bottom of a baking dish, mix with it a small piece of butter, salt to the taste, a small teacupful of milk, and one egg well beaten. Put in the oven and let it bake until nicely browned.

Rice (Boiled).

To a half a teacupful of rice (well washed and picked), allow half a pint of water and a little salt; put it over the fire and let it boil rapidly ten minutes, then drain through a colander. Before removing from the colander pour a little cold water over it, let it drain for a minute, and return to the saucepan with only the water which may adhere to the grains; cover, and set on the oven door or near the fire, where it may swell and dry.

Rice Caudle.

Pour one quart of boiling water over a teacupful of rice which has been well washed and picked, add a little salt, and cook slowly for an hour. Beat the yolk of an egg with a tablespoonful of white sugar to a cream. Pour off the water and stir *slowly* the egg and sugar into the rice; cook for five minutes, then pour into a bowl, and

grate a little nutmeg over it. A glass of sherry wine may be added.

Rice Jelly.

Wash and pick carefully a quarter of a pound of rice, put it in a porcelain-lined pan, with one quart of water, a small piece of cinnamon, and a half pound of loaf sugar, or not, according to fancy; let it boil one hour, pass through a sieve, and when cold it will be a firm jelly.

Excellent in dyspepsia and irritable conditions of the stomach.

Rice Pudding.

Thoroughly wash a coffee cup of good rice, pour over it a pint of water and let it simmer until the grains are well softened, then drain; put the rice in a pudding dish and pour over it one quart of new milk, a small piece of butter, a little salt, and grated nutmeg or cinnamon. Bake thirty minutes, or until the rice is well done. Stir frequently while baking.

Rice Water.

Pick and wash one ounce of rice in cold water, then put in a quart of water and set near the fire, where it may soak and be kept warm without cooking, for two hours, then boil slowly for one hour, until reduced to a pint, and strain; add a little salt. A pint or half a pint of milk added to the rice water, before it is taken from the fire, renders it more nourishing.

An excellent drink in diarrhœa, dysentery, and irritable conditions of the alimentary canal, especially in children.

Sago, tapioca, barley, or cracked corn can be prepared in the same manner.

Sago.

Cleanse a half teacupful of sago by washing carefully, soak two or three hours in cold water, then put it over the fire in the same water, and simmer until the grains become quite clear; it may be sweetened slightly, and a little orange or lemon juice added.

Sago Jelly.

Wash carefully an ounce of sago, put it to soak for four or five hours in a half pint of cold water, then add half a pint of hot water, a little salt, half an ounce of sugar, and a little lemon peel or cinnamon; boil gently fifteen or twenty minutes, stirring constantly. Just before removing from the fire add a tablespoonful of port or sherry wine. Serve hot, or pour into a mould to cool.

Sago Posset.

Boil two ounces of sago in a quart of water until it is the consistence of mucilage. Then mix a teaspoonful of tincture of ginger, with half an ounce of white sugar, and a half pint of sherry wine; add this to the sago and boil for five minutes.

Excellent in debility after acute non-inflammatory diseases, in wineglassful doses repeated.

Sippets.

Put three or four small square pieces of bread on a very hot plate, and pour over them some beef or mutton gravy from which the fat has been well skimmed; sprinkle a little salt over them. The bread may be toasted, if preferred.

Very nutritious when meat is not acceptable to the stomach.

Slippery Elm Bark Jelly.

Stir four tablespoonfuls of ground bark into a quart of cold water; let it stand all night; in the morning strain and add the juice of one lemon; simmer *gently* twenty minutes, then sweeten, and pour in a mould to cool and harden.

Slippery Elm Tea.

Add one pint of boiling water to one ounce of slippery elm bark; cover and stand near the fire for about three hours, and strain.

A nutritious demulcent, useful in renal, intestinal, and other affections.

Staff of Old Age (Consomme).

Make a beef broth by taking two pounds of beef from the leg, round, or chuck; wash well, cut in pieces and put on to boil in three quarts of cold water; while boiling skim frequently, and when reduced to one quart take from the pot and strain, after which return to the digester or pot with a few thin slices of onion, half a pound of lean beef, chopped finely, and well mixed with three raw eggs; beat all thoroughly with the broth, which is to be returned to the fire, and boiled for about half an hour, or until perfectly clear.

Nutritious and healthful, especially to old people with feeble masticatory powers.

Tamarind Whey.

Two tablespoonfuls of tamarinds stirred into a pint of boiling milk; boil ten minutes and strain.

Refrigerant and slightly laxative.

Tansy Water.

Take a dozen leaves of fresh tansy, wash them and pour over them a pint of cold water, cover closely and let stand in a cool place for three or four hours, when it is ready for use. Sage may be used if preferred to tansy.

Refreshing in febrile affections.

Tapioca.

Take two tablespoonfuls of the best tapioca; after washing carefully, soak it in fresh water over-night; add a little salt, a pint of water or milk (the latter being more nutritious); simmer until quite soft, stirring frequently, if milk is used, to keep from scorching. When done pour into a bowl, and stir while cooling; sugar, a little nutmeg, and a spoonful of wine may then be added.

Tapioca Pudding.

Beat the yolks of two eggs with half an ounce of sugar, and stir into a pint of tapioca mucilage, made with milk, as directed above, and bake in a slow oven.

Useful in convalescence. Wine may be added if not contraindicated.

Toast, French.

Take half a dozen water crackers, pour over them enough boiling water to just cover them. Cover them tightly, and while they are soaking simmer a pint of milk with a little salt and a small piece of butter, and when the crackers are quite soft pour the hot milk over them. A little grated nutmeg may be added.

Toast Jelly.

Cut a breakfast roll into thin slices, toast a light brown, and boil gently in a pint and a half of water until it jellies, strain and flavor with a little wine and nutmeg.

Toast Water.

Toast a slice of stale bread quite brown, but do not scorch; while hot put it into a pitcher and pour over it a pint of boiling water; cover tightly, and when cool pour off the liquid. A little orange or lemon put in the pitcher gives a pleasant flavor.

A valuable cooling drink in febrile affections.

Veal Tea.

To be prepared as beef-tea, substituting the veal for beef. It requires, however, much longer cooking.

Vegetable Broth.

Slice a turnip, two or three parcd potatoes, a small carrot, and a stalk of celery in a quart of boiling water; cook until the vegetables are well done, then add a small piece of butter and a little salt. Toast a slice of bread, butter it, put in a bowl and pour the soup over it.

Vermicelli Pudding.

(See *Macaroni Pudding.*)

Whey.

Curdle warm milk with rennet, and strain off the liquid, or put into boiling milk as much lemon-juice or cider as will curdle it and make it clear; then pour off, add a little hot water, and sweeten if desired.

A useful diuretic drink in febrile complaints.

Wine, Mulled.

A pint of wine, half a pint of water, and a teaspoonful of allspice, boil together for three minutes. Beat three eggs with a large tablespoonful of white sugar; pour the boiling *wine on the eggs*, stirring all the time. If the eggs are poured into the wine, they are apt to curdle.

Wine Whey.

Boil a pint of new milk, while boiling pour in a small tumbler of white wine, put it over the fire to boil again, being careful not to stir it, and as soon as it boils remove and set aside until the curd settles, then pour off the clear whey. If too strong add a little water.

Useful in low fevers or those requiring a moderate degree of stimulation.

SPECIAL FORMS OF DIET.

Under this head might be included a consideration of such dietetic hints and precepts as are applicable to the prevention and cure of special diseases. The principles governing the employment of articles of diet appropriate to such conditions are generally, however, sufficiently intelligible to the physician, and it is not difficult for him to decide, in inflammatory and other conditions, what should be interdicted and what allowed. His own medical knowledge, added to the results of the personal experience of the patient, will usually be a sufficient guide to both as to the quality and quantity of the food to be taken. So much benefit, however, has been derived from the practice of strict dietetic regulations in such affections as diabetes, obesity, etc., that the reproduction of rules here will possibly be of service to the practitioner in similar cases.

Dietary for the Diabetic.[1]

As diabetes mellitus is a condition attended with want of assimilative power over the amylaceous and saccharine

[1] F. W. Pavy, Treatise on Food and Dietetics, Philadelphia, 1874.

principles of alimentary substances, such a diet must be prescribed as will, as far as possible, exclude such principles. The following table, although containing several dietetic articles of purely English employment, is reproduced in its entirety, being an especially valuable guide in this disease.

He may eat—Butcher's meat of all kinds, except liver, ham, bacon, or other smoked, salted, dried, or cured meats, poultry, game, shell-fish and fish of all kinds, fresh, salted, or cured, animal soups, not thickened, beef-tea, and broths; the almond, bran, or gluten substitute for ordinary bread;[1] eggs dressed in any way; cheese, cream cheese, butter, cream, greens, spinach, turnip tops, turnips,[2] French beans,[2] Brussels sprouts,[2] cauliflower,[2] broccoli,[2] cabbage,[2] asparagus,[2] seakale,[2] vegetable marrow,[2] mushrooms, water-cress, mustard and cress, cucumber, lettuce, endive, radishes, celery, vinegar, oil, pickles, jelly flavored, but not sweetened, savory jelly, blanc mange made with cream and not milk, custard made without sugar, nuts of any description, except chestnuts, olives.

He must avoid eating—Sugar in any form, wheaten bread and ordinary biscuits of all kinds, rice, arrowroot, sago, tapioca, macaroni, vermicelli, potatoes, carrots, parsnips, beet-root, peas, Spanish onions, pastry and puddings of all kinds, fruits of all kinds, fresh and preserved.

He may drink—Tea, coffee, cocoa from nibs, dry sherry, claret, dry Sauterne, Burgundy, Chablis, hock, brandy, and spirits that have not been sweetened, soda water, Burton bitter ale, in moderate quantity.

[1] See Bran-loaf, p. 411.

[2] May only be eaten in moderate quantity, and should be boiled in a large quantity of water.

He must avoid drinking—Milk, except sparingly, sweet ales, mild and old, porter and stout, cider, all sweet wines, sparkling wines, port wine, unless sparingly, liqueurs.

Dietetic Rules for reducing Weight ("Bantingism").

Although the general principles on which these rules are founded are not new, they have attained greater prominence, within a few years past, from the publication of the experience of one who had successfully subjected himself to their rigid exactions, under the advice of a medical practitioner of London.[1] The mainspring of the system is the avoidance of all starchy and saccharine matters, such as bread, butter, milk, sugar, potatoes, beer, etc., all of which have a tendency, from their chemical composition, to create fat. In elucidation of this dietary plan, the following general bill of fare is offered, similar to that under the use of which a weight of 200 pounds was, in the instance cited, reduced in a year to nearly 150.

BILL OF FARE.

For Breakfast.—Four or five ounces of beef, mutton, kidneys, broiled fish, bacon, or cold meat of any kind except pork and veal, which are not easily digested; a large cup of tea (without milk or sugar); a little biscuit, or one ounce of dry toast, brown bread, or ordinary bread crust; an egg, if not hard boiled.

For Dinner.—Five or six ounces of any fish except salmon, herring, and eels (owing to their oily nature), any meat except pork and veal; green vegetables, and any vegetable except potatoes, parsnips, turnips, beets, and carrots; one ounce of dry toast; fruit out of a pud-

[1] Wm. Banting, Letter on Corpulence. 11th edition. Philadelphia, 1876.

ding; any kind of poultry or game, and two or three glasses of good claret, sherry, or Madeira; Champagne, port, and beer being forbidden.

For Tea.—Two or three ounces of fruit, a rusk or two, and a cup of tea without milk or sugar. A little coffee may be permitted.

For Supper.—Three or four ounces of meat or fish, similar to dinner, with a glass or two of claret.

For Nightcap, if required, a tumbler of grog (gin, whisky, or brandy, without sugar), or a glass or two of claret or sherry.

The latter portion of the bill of fare will doubtless be omitted in the majority of instances. Indeed, the items here indicated should not be blindly followed without the exercise of a watchful care, lest, in individual cases, this systematic reduction should be followed with unfavorable results to the general health. The principles which underlie the construction of such an itemized list are, however, correct, and should govern the practitioner when consulted in cases of corpulency.

It may be added that in the case alluded to a draught was also ordered to be taken, once or twice daily, on an empty stomach, containing a drachm of the aromatic spirits of ammonia with ten grains of carbonate of magnesium, to obviate the induction of the uric acid diathesis as a consequence of the restricted diet.

RULES FOR TESTING AND DISINFECTING IMPURE DRINKING WATER.

The purity of the water supply of towns and cities, and its effects on the health of individuals and of communities, are matters of vital import to all classes and all professions, but the medical man is supposed to be especially familiar with the tests for its impurities, and with the agents that are best calculated to disinfect it. Such knowledge on his part will generally place him in the foremost rank of sanitary reformers, and enable him at times to be of inestimable service in the hygienic improvement of the locality in which he resides.

Tests for Impurities in Water.

A full examination of the character of a potable water as to its organic constituents is, perhaps, one of the most difficult problems in the ordinary run of analytical chemistry.[1] There is organic matter decomposed, decomposing, and ready to be decomposed, to be looked for; a discrimination to be made between organic matter of all grades, from the perfectly inert up to the pestilence-producing; and, more, these frequently can only be recognized by the products of decomposition, usually the same from all classes mentioned.

The tests described are all in use by experts in water-analyses; they have been altered, in some cases, in the details, so that they can be applied by any physician with

[1] Dr. Chas. McIntyre on the Detection of Organic Matter in Drinking Water,—*Phila. Med. Times*, March 6, 1875, from which excellent paper most of these facts are obtained.

an ordinary amount of apparatus. They aim at qualitative, not quantitative determination, and can, therefore, be used on ordinary occasions, while the latter would require the special apparatus of a chemical laboratory with the skill of a professed chemist.

We may have organic material—

I. As to its derivation: *animal*, or *vegetable.*

II. As to its condition: *not decomposed*, or *decomposed.*

a. If not decomposed, either (1) in the same form as it exists in the organism, or (2) changed into some complex organic substance.

b. If decomposed, it may exhibit any of the products of decomposition down to the purely inorganic—*e. g.*, carbon dioxide, nitric acid—and these may be present along with organic material, which may escape detection.

III. As to its effect: *deleterious*, or *harmless.*

If the organic material is of animal origin, the nitrogen compounds will ordinarily be more abundant. These are supposed to exert the greatest influence in causing the water to be unwholesome. The presence of ammonia, or even, perhaps, of albuminoid substances (not readily putrescible), does not, however, of necessity render the water unfit for domestic purposes, or even prove the presence of recent organic material. Unfortunately, most of the methods will not enable us to tell of the source of the organic material, and in doubtful cases it may be difficult to decide as to the condition of the water.

TESTS. 1. *For Organic Matter.*—If a quantity (f℥viij) of water is evaporated carefully to dryness in a clean porcelain or glass vessel, and then heated gently, the blackening of the residue will indicate the presence of the more stable organic compounds, which will all disappear by a further application of the heat with access of air. If

during this latter operation there is any deflagration or rapid combustion, it indicates the presence of nitrates in the water. A very rough approximation of the amount of this organic matter can be made by weighing when dry, and again after it has been burned off. There are very few waters so free from organic matter as not to leave a blackened residue, while at the same time it would be possible to have a water rich in organic material which would leave little or no char. This test, then, is of use when the amount left is greatly in excess of the char from comparatively pure water.

Allow another portion of the water to stand in a warm place, exposed to the light, for several days. Should it become putrid or show the presence of animal or vegetable growths, either to the naked eye or by the aid of the microscope, there should be grave doubts as to the fitness of the water for domestic purposes. It is asserted that at times organic matter is contained in water in such a condition as not to respond to the ordinary reagents until after it has undergone some decomposition. Consequently, in a suspected water, if no reactions can be obtained in the fresh water, it would be advisable to let a portion stand as above, and then test.

The presence of ammonia, nitrous and nitric acids, any or all, indicates the presence of nitrogen in the water. It is possible, however, for this nitrogen to have its origin in inert organic material, or even to have an inorganic origin, and, hence, exercise no deleterious effect upon the water. Their presence is suspicious, and should always be looked for.

In many cases the organic material is readily oxidized by means of potassium permanganate. Render the water slightly acid by means of sulphuric acid, and drop in a few drops of a solution of potassium permanganate; the

solution becomes decolorized, owing to the permanganate giving up its oxygen for the oxidation of the organic material. This test, while not a reliable one when used with so few precautions, may, nevertheless, act as one witness among many to prove the character of the water.

A simple plan for testing for organic impurities has also been suggested[1] by making a solution of chemically pure permanganate of potassium, gr. viij to f℥j of distilled water. Into a half pint of the impure or suspected water in a goblet or tumbler, put one drop of the red solution; if the red tint disappears from the glassful in half an hour, add more of the solution. For every drop that loses its color in the half pint there will be found to be from one and a half to two grains of putrid organic matter in the gallon of water.

2. *Test for Ammonia.*—Nessler's reagent is perhaps the best test for ammonia. It is prepared by dissolving gr. xxxv of iodide of potassium in ℥iij ʒvj of distilled water; to which add a cold concentrated solution of mercuric chloride until the mercuric iodide at first forms, then dissolves by agitation in the solution, and at length produces a very small permanent precipitate; 100 grains of caustic potassa are next dissolved in ℥vj ʒij of distilled water; mix the solutions, and add distilled water to make ℥xv ʒv. This added to water containing .03 of a grain of ammonia to the gallon will give a yellow color; a larger amount of ammonia a brownish-yellow color.[2]

This reagent may be extemporaneously prepared by adding to a solution of potassium iodide (1 pint of salt to 20 pints of water) a solution (1 to 16) of mercuric chloride (corrosive sublimate) until a permanent precipi-

[1] Report of the New York Board of Health for 1873, p. 574.

[2] Transactions of the Medical Society of the State of Pennsylvania, vol. x. p. 19.

tate is produced. Then add about twice the volume of liquor potassæ, let stand for a few days, and decant from the sediment. This will be delicate enough to detect an exceedingly small quantity of ammonia; a brownish precipitate or coloration being formed, depending on the amount of ammonia present. If there is much testing to be done, the reagent had better be prepared according to the formula.

3. *Test for Nitrous Acid.*—Nitrous acid is readily detected by its power to liberate iodine from potassium iodide. Prepare some starch paste, add about one-eighth the volume of the solution of potassium iodide, acidulate the water with hydrochloric, or, preferably, sulphuric acid, to liberate the nitrous acid if combined as a nitrite, and then add the mixture of starch paste and potassium iodide. The immediate formation of blue iodide of starch will indicate the presence of nitrous acid. Pure acids and clean vessels must be used to insure accuracy.

4. *Test for Nitric Acid.*—To test for this acid, the unignited residue had better be employed. Dissolve some morphia, or, better still, brucia, in a drop of sulphuric acid, on a piece of white porcelain; it should develop no color; if now a few pieces of the solid residue be added, the presence of nitric acid will be shown by a rose-red coloration in the former instance, or a deep blood-red if brucia has been used.

5. *Test for Sewage-matter.*—When the water may be contaminated with sewer-refuse, there is a large increase of the alkaline salts, notably common salt—sodium chloride—the chlorine of which can readily be detected after rendering it strongly acid with *pure* nitric acid, by a solution of silver nitrate, a white curdy precipitate being formed. Since this salt is normal in small quantities in

most waters, the resulting precipitate should be quite decided to indicate any sewage-matter.

6. *Test for Albuminoid Matters.*—This test, known as Chapman & Wanklyn's test,[1] requires more laboratory manipulation. It attempts to give us intelligence of animal matter while still in an albuminoid condition, and depends on the principle that a solution of caustic potash and potassium permanganate is able to cause the nitrogen of albuminoid substances to enter into combination with hydrogen and form ammonia, which then can be detected by Nessler's reagent. To apply the test, it is first necessary to remove all ammonia in the water, as well as urea, which readily changes into ammonia; this is done by distilling a portion of the water until portions of the distillate give no reaction with the Nessler solution; then add a strong solution of potassium hydrate and a solution of potassium permanganate; collect the distillate, and examine again for ammonia. Its presence indicates albuminoid material in the water.

How to Disinfect Impure Drinking Water.

To purify such water, if it must be used, drop in a solution of chemically pure permanganate of potassium, gr. viij to f℥j of distilled water, until a slightly perceptible red tint remains in the water. This very weak solution of permanganate is not unwholesome; but for common purposes and among the poor it is better to depend upon the thorough boiling of impure water, if such water must be used. The permanganate quickly tests the presence of organic impurities. It destroys them by instantly oxidizing or burning them.

It is contended by some that recently calcined charcoal, well pulverized, is the only substance which can with im-

[1] Jour. Chem. Soc., xx. 445, 591.

punity be mingled with water in excess, without communicating taste or hurtful properties. It is usually placed in layers between clean gravel, or broken quartz, through which the water is filtered. The charcoal should be frequently renewed, for as its efficiency depends alone on its absorbent power, it becomes inert when saturated.

If water be boiled to deprive it of infectious germs and of odor, it should afterwards be exposed for a time to the air, to absorb again a portion of oxygen and carbonic acid.[1]

It has been found that $\frac{1}{20000}$ of salicylic acid will keep river or pond water in casks perfectly fresh, and without unpleasant taste, for weeks. A plan has been suggested to prevent the decomposition of water on shipboard, by adding the acid in the proportion of one part to 200,000, by covering the bung-hole of the casks with cotton-wool steeped in salicylic acid, the preservation being effected by the filtration of the air.[2]

Although an attempt has been made to classify the hurtful impurities of water, and the diseases which they may severally produce, it need hardly be said that in the great majority of instances of faulty sanitation connected with water supply, there is often a combination of impurities and of diseases both.[3] For example, the analysis of waters which have proved to be decidedly injurious shows that, in general, the impurities are numerous, and, on the other hand, not one but several diseases may be either directly produced or indirectly influenced by them. And this difficulty of apportioning to special impurities their special effects is frequently increased by the presence of other causes of disease. Thus,

[1] S. Oakley Vander Poel, M.D., Transactions of the Med. Soc. of the State of New York for 1875, 233.

[2] British Medical Journal, February 20, 1875; Boston Med. and Surg. Journal, March 11, 1875.

[3] A Handbook of Hygiene and Sanitary Science. By Geo. Wilson, M.A., M.D. Fourth edition, 1880.

the water may not only be polluted, but the supply may be scanty, and thereby give rise to great want of cleanliness of the person, of clothes, of cooking utensils, and of the general surroundings; while overcrowding, defective sewage-removal, badly ventilated drains, and other causes of disease, may also co-operate in seriously affecting the health of a community and largely increasing the death-rate.

Amongst other diseases which have frequently a water origin may be mentioned ulcerated sore throat, low fever, and erysipelas. Indeed, in purely country districts, what is known as low fever is essentially a filth fever, and is found to be produced, in the great majority of instances, by polluted well water. It would also appear that the prevalence of calculous disease and gravel bears a close relation to the amount of lime and magnesia salts contained in the drinking water of certain parts of the country. Finally, it has to be noted that several of the entozoa find their way into the body through the agency of drinking water, as, for instance, the bothriocephalus latus and the ascaris lumbricoides.

HOW TO CONDUCT A POST-MORTEM EXAMINATION.

HOW TO CONDUCT A POST-MORTEM EXAMINATION.

THE practitioner must so conduct these investigations as to leave behind no offensive traces of his work, and must avoid wounding in any way those whose susceptibilities at that time are particularly impressible. To insure a satisfactory performance of a post-mortem examination, certain preliminary arrangements are necessary.[1]

What to Provide.—The undertaker must have the body ready. The carpets must be thoroughly protected from injury from the dripping of fluids, discharges, etc. The family must provide hot and cold water, a waste bucket, and basins, sponges, bran, a small funnel, oil for the hands if necessary, or preferably collodion, which is also useful in gangrene, etc., a small water pitcher, towels, and rags. In order to label specimens for preservation, the operator should provide himself with slips of wood on which he can write with a lead pencil, as the lead is not acted on by the fluids.

Instruments.—Under ordinary circumstances, the physician will be able to perform a post-mortem examina-

[1] Many of the facts detailed in this chapter have been arranged and condensed from the following sources: R. Virchow, A Description and Explanation of the Method of Performing Post-mortem Examinations in the Dead-house of the Berlin Charité Hospital, translated by T. P. Smith, Philadelphia, 1877 (from Med. Times and Gazette, 1876); C. Heath, Manual of Minor Surgery, etc., Philadelphia, 1875; and manuscript notes of Lectures on Pathological Anatomy in Jefferson Medical College delivered by Dr. W. W. Keen, and kindly loaned by him.

tion satisfactorily if provided with a case of instruments containing two large knives, two small knives, a saw, rachitome, scissors, a hammer, forceps, needles and thread, and a pocket measure; or an ordinary dissecting case *plus* a saw, rachitome, hammer, needles and thread.

Important suggestions, however, as to instruments, have been made by Virchow for the more satisfactory performance of these operations.

The blade and handle of the ordinary dissection-knife are made by him thicker and broader; the anterior part of the blade rounded off, the very broad surface terminating with a considerable curve in the slightly projecting point, thus lengthening the cutting edge and diminishing the risk of pricking one's self or others. On the back part of the knife the blade is narrow and strong near its insertion, the handle flatter posteriorily, and much curved inwards from both edges, to lie more conveniently in the hand. In its original condition, before being ground down, the knife is twenty-three to twenty-four centimetres long, of which nine and a half belong to the blade. The incisions with this knife should be with a traction movement, rapid rather than forcible, to avoid crushing, as in the brain. Place the handle between the thumb and forefinger only, so that great pressure is impossible. If pressure be required, use a knife with a stronger handle than the ordinary cartilage knife, a thicker and more bulging blade, and a broader back, to which the forefinger or thumb may be conveniently applied; the handle made of two strong plates of wood or horn, one of them being applied to each side of a flat prolongation of the blade, reaching the entire length of the handle; the back of such a knife being sixteen millimetres broad, the free end of the handle flattened and broad. To sum up—the operator

requires a section knife for dissecting large viscera; a strong cartilage-knife for coarser work, such as dividing cartilages, large incisions through skin, muscles, joints, etc., and a dissecting knife for the finer parts, vessels, nerves, etc.

The operator should also have a bag for his instruments, or to carry away specimens for preservation. In the bag, he should carry oiled silk and tin seidlitz-powder boxes, and a bottle of Lugol's solution, to detect amyloid degeneration. In winter, the overcoat pocket will form a convenient receptacle for various articles. In medico-legal examinations, additional caution is necessary that clean glass jars be used. Sealing wax, a seal, and string should also be provided.

What to Observe.—In medico-legal cases special care must be exercised to ascertain three distinct points:—

1. Was the individual viable, and did he live?
2. If he has lived, how long has he been dead?
3. The cause of death.

In medical cases, the latter inquiry alone is necessary, together with

4. The pathology of the disease.

Notes of Cases.—In noting, on the instant, the appearances revealed, state the exact time of the examination, and how long after death it is made; enter only facts observed and not inferences. Measure everything; guess at nothing. If nothing abnormal be found in any organ, state the fac . If desirable, take specimens home for microscopic examination.

The Collection of Data at Autopsies.[1]

As the object of collecting data of this sort is to determine the normal standard of size for the various organs at different ages, as well as the variations from this standard which are associated with different diseases or tendencies to disease, it is important to neglect no opportunity of securing a complete set of measurements, whatever may be the age, sex, or manner of death of the individual.

As an example of the kind of problems to be solved by investigation of this sort, attention is called to the result of Professor Beneke's observations:—

1. Before the period of puberty the aorta is *smaller* than the pulmonary artery; after this period the relation begins to be reversed, and in advanced life the aorta is always *larger* than the pulmonary artery.

2. The aorta and pulmonary artery are absolutely smaller in the female than in the male, but relatively to the length of the body there is scarcely any difference between the circumference of the arteries in the two sexes, while the heart in females is absolutely as well as relatively a little smaller than in males.

3. In adult males the volume of the lungs is greater than that of the liver; in adult females the reverse seems to be true.

4. In men the volume of the two kidneys is nearly equal to that of the heart; in children it is greater.

5. Children have a relatively larger intestinal canal than adults.

6. A sudden increase in the size of the heart occurs at the period of puberty.

7. The iliac arteries diminish in size during the first three months of life.

[1] From a report presented to the Massachusetts Medico-Legal Society. February 1, 1882, by Drs. H. P. Bowditch and F. A. Harris.

8. The cancerous diathesis is, in the majority of cases, associated with a large and powerful heart and capacious arteries, but a relatively small pulmonary artery, small lungs, well-developed bones and muscles, and tolerably abundant adipose tissue.

9. Pulmonary tuberculosis is often associated with an unusually small heart.

10. In constitutional rachitis the heart is generally large and well-developed ; the arteries are also large.

How to Preserve the Record of an Autopsy.

1. Age......years......months.
2. Sex..................................
3. Cause of death...................
4. Height of body..............cm.
5. Weight of body............kilo.
6. Heart, weight........grammes ; volume..................cc.
7. Lungs, weight........grammes ; volume..................cc.
8. Liver, weight.........grammes ; volume..................cc.
9. Spleen, weight........grammes ; volume..................cc.
10. Kidneys, weight.....grammes ; volume..................cc.
11. Testicles, weight.....grammes ; volume..................cc.
12. Uterus, weight.......grammes ; volume..................cc.
13. Ovaries, weight......grammes ; volume..................cc.
14. Brain, weight.........grammes ; volume..................cc.
15. Stomach, weight.....grammes.
16. Small intestine, length..........cm.
17. Large intestine, length..........cm.
18. Circumference of ascending aorta......mm.
19. Circumference of pulmonary artery......mm.
20. Circumference of thoracic aorta......mm.
21. Circumference of abdominal aorta......mm.
22. Time between death and autopsy......hours.
23. Rigor mortis.....................

A description of the organs, if in any way abnormal, should be given on the opposite side of the sheet, the paragraphs of the description being numbered to correspond to the record.

Signature of Examiner...................................

Instructions for Making Measurements at an Autopsy.

The measurements required in this record call for special explanation only so far as they relate to the determination of the volume of organs and the circumference of arteries.

The volume of an organ is most simply determined by immersing it in a vessel previously filled to the brim with water, and measuring the amount of water which is thus caused to flow over the edge. The sort of vessel most convenient for this purpose will vary with the size of the organ under investigation. For large organs like the liver a large stone jar or a water pail set in a large basin or tin pan will be found convenient. For smaller organs, such as the testicles, a cup and saucer may be used. It is desirable to use a vessel which has one point of its brim lower than the rest, so that the overflow may always take place from that point. If such a vessel cannot be conveniently procured, the same result may be accomplished by placing the vessel in a slightly inclined position. The volume of the water displaced by the organ can be measured by pouring it from the vessel into which it overflows into a graduated cylinder. Such cylinders, from ten to one thousand centimetres' capacity, may be obtained from the Metric Bureau.

In the case of organs which float in water (for example, the lungs) a weight must be attached, to effect complete immersion, and proper allowance made for volume of the weight.

The circumference of arteries is measured by opening them along one side, spreading them out flat, and applying a millimetre scale to their inner surface.

Precautions as to Measurements.—The following precautions are to be observed in taking the measurements and in making up the record of the autopsy:—

The *age* should be recorded in years and months, in the case of children less than two years old. For older children and for adults it is sufficient to record the age at the last

birthday. When the age is estimated, and not accurately known, the fact should be stated in the record.

The *height* of the body is best measured by placing boxes or other square-cornered objects against head and feet of body as it rests horizontally on the floor or table, marking position of the boxes upon the surface on which they rest, and measuring the distance between the marks thus obtained.

The *weight* of the body of an adult may be determined on small grocer's scales, by placing it upon a board laid across the platform. The weight of the board must be deducted.

The *heart* is prepared for measurement by opening all its cavities and removing the clots, by cutting off the aorta and pulmonary artery on a line with the upper border of the semilunar valves, by cutting off the veins at their junction with the auricles, and by removing adherent portions of pericardium. In measuring the volume of the heart by immersing it in water, care should be taken to prevent air bubbles from being entangled by the valves and trabeculæ. If an unusual amount of fat is adherent to the muscular substance of the heart, the fact should be stated in the record.

The *lungs* are prepared by removing the bronchial glands and adherent portions of pleural membrane, and by cutting off the blood-vessels and bronchial tubes as near as possible to the hilus. A weight of 0.5 to 1 kilogramme, to insure the immersion of the lungs, may be best attached by means of a large, sharp hook, on which the lungs can be impaled. It is particularly important, in the case of the lungs, to give a full account of any pathological changes that may be noticed, such as œdema, engorgement, etc., otherwise the determination of the volume and weight has little value.

The *liver* is prepared by removing adherent portions of the diaphragm and vena cava, as well as the ligaments and the gall bladder. The vessels are to be cut off close to the hilus.

The *spleen* is prepared by removing from the hilus the fat, connective tissue, and blood vessels.

The *kidneys* are prepared by removing the capsules, and freeing the hilus as far as possible from fat, connective tissue and vessels. The *testicles* are prepared by cutting off the cord on a level with the head of the epididymis.

The *uterus* is prepared by cutting off the ligaments as close as possible to the body of the organ, and removing adherent portions of the vaginal walls. The *ovaries* are prepared by removing adherent portions of the peritonæum.

The *brain* is to be removed in the usual manner, the medulla being divided at the point of the calamus scriptorius.

The *stomach* is prepared by separating from the œsophagus and the intestines at the cardiac and pyloric orifices respectively, and by removing adherent portions of peritonæum and fat. The organ is to be opened along its lesser curvature, and the contents entirely removed.

The length of the *small intestine* is measured from pylorus to ileo-cæcal valve. The organ is prepared by removing the mesentery as completely as possible, and forcing a stream of water through it, to remove intestinal contents. It is then to be spread out upon a table. From the elasticity of the intestine, an error of two per cent. is hardly to be avoided.

The length of the *large intestine* is measured from the origin of the appendix vermiformis to the anus. The organ is prepared in the same way as the small intestine.

The circumference of the *arteries*, to be determined as above described, is measured at the following points:—

Ascending aorta, one centimetre above border of the semilunar valves. *Pulmonary artery*, same as ascending aorta.

Thoracic aorta, at point one-third of distance from origin of left subclavian artery to bifurcation of abdominal aorta. *Abdominal aorta*, two centimetres above its bifurcation.

State, if possible, duration and intensity of *rigor mortis*, and whether it had entirely disappeared at time of autopsy.

External Examination.

Special care is needful even to the smallest particulars.[1]

1. *Position of the Body.*—It has a marked bearing as to question of violence and mode of death.

2. *Clothing.*—Important in relation to identity; if torn, it may prove violence. After and closer examination may detect spots of blood, or semen (rape), fecal matters in infanticide, etc.

3. *Condition* of the subject as to putrefaction, etc. Important as bearing on date and cause of death, or on identity. Even in case of advanced putrefaction, the examination must be conducted, for the hair, nails, teeth, lesions of the bones, arteries, foreign bodies, poisons, pregnancy, etc., afford data to guide judicial examinations.

4. *Age.*—In children recognized by extent of ossification, especially of the lower end of the femur, at the ninth fœtal month.

5. *Sex.*—Not always easily determined, by reason of anomaly or putrefaction or destruction. The presence of the uterus, beard, breasts, parting of the hair, etc., will or may assist us.

6. *General Conformation, Constitution, Emaciation, etc.*—These have a bearing on previous state of health, identity, strength necessary for the crime, etc.

7. *Warmth* of various parts and *Rigor mortis* to be noted; cause of the latter may be coagulation of the muscular substance. If death is sudden it is delayed.

8. *Color of Skin*, white or negro. Hypostasis is not to be mistaken for congestion or violence. All livid spots

[1] Casper relates a case where the body was exhumed three times, the second time to determine about some cicatrices which had not been fully reported, and the third time to examine the teeth—these bearing on the identity.

should be cut into to see whether the blood be still in the vessels or effused into the tissues. Blood may even coagulate in a post-mortem cut. The skin may be discolored by Addison's disease, yellow fever, etc.[1]

9. *Anomalies* of all kinds, as cicatrices (from buboes, chancres, wounds), tattooed spots, herniæ, etc.; deficiency of members; ulcers, dirt or fecal matter on the body, abrasions, wounds, etc., even down to the *slightest* mark of a cord around the neck or other part, or even the trace of a ring having been worn.[2]

10. *Abrasions, Wounds, etc.*—If blood from them be on the person, it should be so stated. The size, exact position (measured), and nature of the wounds, etc., should be noted, whether incised, lacerated, contused, etc. Their direction and depth must be stated and compared with any instruments found anywhere that might be supposed to be the means of violence. Their internal lesions and connections must be investigated at a later stage of the examination.

11. Take up each region separately, and examine the *hair*, *teeth*, *mouth*, as to its contents of foreign body, fæces, etc.; *tongue*, as to the presence of acids, alkalies, etc.; *nose*, its condition, presence of foreign bodies, etc.; *eyes*, as to anomalies, color of iris, etc.; *vagina*, *rectum*, etc., for foreign bodies; *generative organs*, groins, etc., for evidence of anomalies and disease.

In *very young children and fœtuses*, other points must be examined, as the fontanelles, diameters of the head, which vary at different months; the eyes for the membrana capsulo-pupillaris, which disappears at the seventh

[1] Under the subject of Internal Examination (p. 505) will be found further remarks on coloration, etc.

[2] Casper gives a case in which a body was disinterred in order to see whether a ring had been worn, so that identity might be established.

month; the nails; ossification of various bones; the scrotum, for the presence or absence of the testicles,[1] etc.

Internal Examination.

Usually we examine only the thorax, abdomen, and pelvis; the head and spine, if necessary. In medico-legal cases the examination should begin where we suspect the cause of death, and thence extend to other parts. If the subject be an infant and viable, the abdomen is first to be opened, to ascertain the position of the diaphragm.

The operator should not omit a single part, or his testimony may be impugned, either as a medical witness, if he reports the case, or as a legal one, and this omitted part might be assumed as the seat of the cause of death.

Protect the hands, before making the internal examination, with oil and soap. This diminishes the probability of absorption of matter, but has the disadvantage of rendering the holding of instruments more difficult.[2]

[1] During the fifth or sixth month the testicle descends to the iliac fossa; seventh month enters the inguinal canal; at end of eighth month passes into the scrotum.

[2] At the outset of the internal examination, it may be well, for the sake of reference, that the practitioner should be reminded of the

*Average Weight of the Various Organs.**

	Male.	Female.
Brain	$49\frac{1}{2}$ oz. avoir.	44 oz. avoir.
Cerebrum	43 oz. 15 dr.	38 oz. 12 dr.
Cerebellum	5 oz. 4 dr.	4 oz. $12\frac{1}{4}$ dr.
Pons and medulla oblongata	$15\frac{3}{4}$ dr.	1 oz. $\frac{1}{4}$ dr.
Spinal cord	1 oz. 4 dr.	1 oz. 4 dr.
Heart	11 oz.	9 oz.
Lungs	right, 24 oz. left, 21 oz.	right, 17 oz. left, 15 oz.

* Tabulated from Quain and Sharpey's Anatomy, in Heath's Manual of Minor Surgery, etc.; Phila. 1875, p. 288.

Incisions.—Short quick cuts are not to be made in autopsies, as in ordinary dissections, as they are tedious and cause too much division of the larger organs; while free incisions, possibly involving the whole of the organ, save time and give increased insight and clearness. The knife-handle should be grasped in the palm, the blade appearing as a direct prolongation of the arm when stretched, the cutting movements being made with the whole arm. The right arm must be free, and the elbow raised quite away from the trunk, so that the flexed forearm may be moved freely, and in any direction backwards or forwards, making it easy to divide the integuments of the trunk by a single long incision from the chin to the symphysis pubis, or to display the lung from apex to base in two halves. Incisions should not completely separate the portions of an organ, so that we may restore the connection of parts, in case re-examination be necessary.

Order of Examination.—The abdomen must be opened —but not dissected—before the thorax, to ascertain the position of the diaphragm and various organs, abnormal abdominal contents or adhesions, penetrating wounds, foreign bodies, color of exposed parts, etc. Note also how much fat is present in the subcutaneous areolar

	Male.	Female.
Thyroid	1 oz.	2 oz.
Liver	53 oz.	45 oz.
Pancreas	3 oz.	3 oz.
Spleen	6 oz.	5 oz.
Kidney	$5\frac{1}{2}$ oz.	5 oz.
Suprarenal capsule	1–2 dr.	1–2 dr.
Prostate	6 dr.	
Testis	1 oz.	
Uterus (virgin)		7–12 dr.
Ovary		1–$1\frac{1}{2}$ dr.

tissue. The position of the diaphragm is important for establishment of the respiration-test in the new-born. The thorax must be dissected first, lest by removal of the liver, stomach, etc., and division of the abdominal vessels, a collapsed and emptied condition of the right side of the heart may result. The stomach may, however, be at once removed in cases of suspected poisoning. If the thorax be opened first, and the anterior attachments of the diaphragm divided, the general and relative position of the abdominal viscera, thus displaced, and their relation to injuries of the abdominal walls, cannot be readily determined. Peritonitis might exist; it would be a nice point to determine whether it is due to traumatic causes or a pathological process in one of the abdominal viscera.

Coloration and Condition of Vessels.—It is a fallacy that arterial blood and arterial vessels are distinguishable by their deep-red or bright-red color, and that in a dead body arterial injection can be recognized by the color test. In the veins or plexuses formed by venous radicles, venous blood may absorb oxygen, and venous hyperæmia thus assume the appearance of arterial injection. The coloration, which has really occurred from exposure during the dissection, after opening the abdomen, for example, might be mistaken for inflammation or irritation. The color must be determined at the moment of opening the abdominal cavity, before the oxygen of the atmosphere has had time to affect it.

True capillary injection cannot be recognized by the naked eye; it is red tissue, not red capillaries, that is seen, and what is generally called hyperæmia is usually only veins. The venous or arterial character of a vessel cannot be determined by the quality of the blood contained in it, but by its structure, connections, and position; in puzzling cases the course of the vessel must be followed

to a point at which its size becomes a sufficient guide. Note the quantity of blood in a vessel, the kind of vessel, the degree of fulness (as profuse, slight, bloodless, etc.). Manipulation, as of the intestines, etc., diminishes the quantity of contained blood, and of gaseous, fluid, and solid matters.

EXAMINATION OF THE THORAX.

The reasons for opening—not dissecting—the abdomen before examining the thorax, are stated elsewhere (p. 505).

To open the thorax and abdomen, a free incision should be made from the chin to the pubes, along the middle of the sternum and down to that bone, through the skin to the umbilicus, passing around the latter. Then by deepening the incision from the lower portion of the sternum, open the peritoneal cavity for an inch or two, introduce the first and second fingers of the left hand, with which to hold up the abdominal wall, passing the knife between them, with its back to the intestines, and cutting through the whole thickness of the muscles at once down to the pubes. Then dissect off the skin and pectoral muscles from the sternum and costal cartilages.

The knife must be carried through the sterno-clavicular articulation on each side, by introducing it downwards and outwards at a point close to the inner end of the clavicle; then divide all the costal cartilages as close to their ribs as practicable, bearing in mind that the cartilage of the first rib is further from the median line. In older persons, the cartilages may be somewhat calcified. Lift up the inferior end of the sternum and divide the attachment of the diaphragm and the cellular tissue, and remove the sternum, with the pleura partially detached, exposing the lungs to view. In this operation, and while making the incision through the first rib and the articulation,

take care not to wound the large veins, and thus fill the pleural sacs with fluid or coagulated blood, rendering it impossible to determine their other contents.

We have not one thoracic cavity but two separate pleural sacs and pleural cavities, a pericardium and pericardial cavity. In opening the pleural sacs, note the position, color, etc., of their contents, amount and character of the fluid, presence of a foreign body, of adhesions, wounds, etc. Ascertain the existence of hæmatothorax, hydrothorax, and pleuritis, and leave the lungs and pericardium for subsequent observation.

The lungs should not be removed from the thorax before the heart has been examined, for the pulmonary artery and veins will be separated from them, and the left auricle, trunk of the pulmonary artery, and the right ventricle will be partially emptied.

THE HEART.—Open the pericardium by a vertical incision, examine its condition, amount of fluid, the appearance, position, size (atrophied or hypertrophied), shape, consistence (fatty, etc.) of the heart, amount of blood in the superficial vessels, and of fat in the sub-pericardial areolar tissue. Then open the heart *in situ*, to determine at first the quantity of blood in the cavities and the capacity of the auriculo-ventricular orifices, especially of the left side. Deaths from asphyxia and paralysis of the heart probably occur from overfilling, in the first case, of the right ventricle, in the second of the left. To determine the sufficiency or capacity of valves, all the parts belonging to the auriculo-ventricular valves, the chordæ tendineæ and musculi papillares, must be retained in their integrity. As the base of the heart must be preserved, on account of the attachment on the two sides respectively of slips of the tricuspid and mitral valves, and as each auricle and ventricle must be examined separately, four distinct in-

cisions are necessary. In case it should not be expedient to remove the heart, a tolerably complete examination may be made according to the following brief directions:—

1. *To examine the right ventricle*, carry the incision from close to the base of the right border of the heart, deeply and forcibly into the interior of the ventricle, bringing the knife out towards the apex, without going down so far as to wound the septum. This incision is a guide for the three others, the place for each incision being found in a plane taking the direction of the first.

2. *To examine the right auricle*, commence the incision half way between the places of entrance of the venæ cavæ, and let it end close to the base.

3. *To examine the left auricle*, the incision should commence at the left superior pulmonary vein, and end close to the base, as indicated by the prominent coronary vein. The coronary vessels should not be injured.

4. *To examine the left ventricle*, begin the incision close below the base, carry it deeply and forcibly through the wall of the heart, and let it end just short of the apex.

The heart is brought into proper position for *examination of the right side*, by pushing the firmly extended left forefinger under the organ, and keeping it against the base, so that the ventricular portion hangs down over the forefinger. Then turn the heart on its axis towards the left until the right border presents anteriorly, press the left thumb just behind this border at the base, and make, one after the other, both the incisions for the right side, as above described.

To examine the left side, draw the apex upwards and to the left, and place the heart encircled in the fingers of the left hand. By gentle pressure, make the posterior wall to bulge out a little, and withdraw itself from the septum.

Then make the incisions for the left side as above described.

After making the incisions in the right side, remove and examine the quality and quantity of blood from the right auricle; then insert the left index and middle fingers from the auricle through the tricuspid opening into the ventricle, and endeavor to open this latter cavity. Remove the blood from the right ventricle, determine it as before, and do the same on the left side. Do not examine the valves at this stage, as adhesions, coagula, etc., may be disturbed. The contracted condition of the left side of the heart must be borne in mind, but this contraction, with the rigor mortis, may be overcome by gentle pressure.

To remove the heart, introduce the left index finger into the left ventricle, and the thumb into the right, through the already existing incisions; raise up the apex, and with it the whole of the heart, and with three or four long, free, horizontal incisions, made not too close to the heart, divide the venæ cavæ, the pulmonary veins and artery, and the aorta, all together. After removal, examine the cut openings of the aorta and pulmonary artery, the size of these vessels, the thickness of their walls, and remove any and all coagula. Examine the capacity for closure of the arterial orifices by pouring water into the aorta and pulmonary artery, holding the heart freely suspended in the air, so that the orifices will not be closed or the walls compressed by pressure of the hand. The points of the fingers should be applied to the vessels to be examined, or externally near the base of the valves, so that the plane of the orifice shall be exactly horizontal, and not drawn to any side. To prevent dragging, stretching, or valvular closure, both hands must be used,

to support the heart properly, and the water must be poured in by a second person.

In examining the aortic orifice, apply the tips of the fingers closely around it on the right and left auricles and pulmonary artery; for if applied simply to the edges of the aortic opening, the parts may be stretched unequally, and besides we have to divide the aorta again at a distance of four or five centimetres above the orifice by an incision parallel to the plane of the aperture. If the coronary arteries were divided when the left side of the heart was first incised, the water poured in may escape through them. In the case of the pulmonary artery it is different, and to test the pulmonary orifice the heart can be suspended by fixing between the fingers the edges of the opening into the vessel.

For thorough examination of the heart, after removal, place it exactly in the position it occupied in life, on a board or table. The parts to be examined are the auriculo-ventricular valves, with their chordæ tendineæ and musculi papillares, the cavities themselves, their endocardium, the arterial valves, auriculo-ventricular septum, and muscular substance.

For the right ventricle, the incision is made in a straight line prolonged from the pulmonary artery, and near the base of the heart, with a long pair of scissors; one blade being inserted into the previous incision in the right border (p. 321), and carried towards the pulmonary artery, care being taken, by introducing the blade in front of the papillary muscle, and carrying the incision close to the base, not to cut through the muscle of the tricuspid valve with its chordæ tendineæ, which would interfere with the demonstration of the tricuspid valves.

For the left ventricle, the incision, with similar scissors, is in a straight line prolonged from the ascending aorta,

and close to the septum ventriculorum; commencing at the apex and dividing the anterior wall of the ventricle and of the aorta. Care must be taken not to divide the base of the mitral valve. Avoid cutting through the valves of the pulmonary artery by drawing that vessel to the right when making the incision, and by continuing this to the left, close to and behind the artery; not too far to the left, as the right border of the base of the mitral valve is inserted quite close to this spot, and this valve is connected immediately with the left border of the aortic orifice. If the incision goes only a few millimetres too much to the left, that portion of the mitral valve will be cut off which forms this junction, and the result will be an aperture in that valve when the divided portions of the heart are put in apposition. Externally this spot corresponds exactly with the right border of the base of the left auricle, and should be the guide, the incision being carried through midway between the pulmonary orifice and the left auricle.

This completes the examination of the heart—all of which can be done in ten minutes—unless it be desirable, in exceptional cases, to open the auricles by cutting through their wall with the scissors, between the openings of the venæ cavæ on the right, and of the pulmonary veins on the left side; or to make further incisions in the muscular substance or the coronary arteries.

THE LUNGS.—In examining the lungs we must take care not to injure the root, where the vessels, nerves, and excretory ducts occupy important relations, as it may be necessary to probe, dissect, inject, or use the blowpipe in the vessels or canals. As already stated, the lungs should not be removed until after the examination of the heart. Should it be desirable to remove the lungs and heart together, tie the trachea and vessels to

prevent the exit of blood and air. Then cut through the trachea, dissect it from the œsophagus, divide the great cervical vessels, and separate the heart from its remaining attachments to the diaphragm. We must examine whether the lungs float in water, whether they have breathed, and in adults, to see if there be consolidation, and also crepitation. If we cut the lungs in pieces, examine whether the pieces float. In opening the lung divide each lobe, by a perpendicular incision from above downwards, and from its thick border towards its inner (anterior, medial, sharp) border. Lay open the bronchial tubes, if necessary, by scissors introduced along the posterior wall of the trachea. Note any evidences of pneumonia, and examine the bronchial tubes, the parenchyma, bronchial glands, etc.

The larynx, tongue, etc., are sometimes removed with the lungs, and their condition examined, but not usually in private practice.

THE LARYNX.—Make an incision from the chin to the sternum, carefully dissecting back the skin, and then separate the floor of the mouth from the jaw, pulling the tongue down through the opening. Divide the pillars of the fauces, and the pharynx; and the tongue, pharynx and larynx may be brought down together, and, if necessary, separated from the lungs.

EXAMINATION OF THE ABDOMEN.

The usual *order of sequence* in the examination of the abdominal organs, except in special cases, should be as follows: The omentum; spleen; left kidney, suprarenal capsule, and ureter; the right ditto; the bladder, prostate gland, vesiculæ seminales, and urethra; the testicles, spermatic cord, and penis; or the vagina, uterus, Fallopian tubes, ovaries, etc.; the rectum; duodenum and intestinal

portion of the ductus communis; stomach; small omentum, gall-ducts, vena portæ, gall-bladder, and liver; pancreas and semilunar ganglia; mesentery, with its glands, vessels, etc.; small and large intestine; retro-peritoneal lymphatic glands, receptaculum chyli, aorta, and vena cava inferior.

In regard to some of these organs no special directions are necessary, as they are removed without trouble or simultaneously with others of greater importance.

The mode of opening the abdomen has been already described (p. 319).

The Spleen.—This organ may be divided by a single long cut from above downward, over the middle of its outer or convex surface. The same precautions as to wounding the hilus are necessary as in the examination of the lungs (p. 324). Note the size, color, and appearance of the capsule and parenchyma.

The urinary organs should be examined in the following order: The kidneys, ureters, bladder, and urethra. The suprarenal capsules and generative organs will be examined in connection with them.

Kidneys.—Remove the organ with the suprarenal capsule, and take away the fat. Note the size, consistence, external appearances, etc. In opening the kidney, make a single cut from the external to the internal border; and examine the cortical and medullary substances, the pelvis of the kidney (for renal calculi), and if fatty degeneration be suspected make a microscopic examination. In removing the organ, divide the lumbar peritoneum, and draw the kidney forward, dividing the vessels and ureter. Label the organs, right and left, to distinguish them.

If deemed necessary, examine also the *Suprarenal capsule* and *Ureters.*

The Bladder.—This organ is not usually removed.

Note whether it is distended, the thickness of the walls, appearance of the mucous membrane, etc. In medico-legal cases, draw off the water, and put it in a clean jar. The bladder may be removed alone, or with the *rectum*, *uterus*, and *ovaries;* in the latter case, by dividing all the structures on the floor of the pelvis close to the levator ani muscle.

If the *urethra* is to be removed with the bladder, a portion of the pubes may be divided, and by proper incisions, and division of the penis, the latter, the urethra and bladder can be removed together.

The *prostate gland* and *vesiculæ seminales* may also be examined.

THE TESTICLE.—To open this organ, make a single incision in a perpendicular direction from its free to its attached border, the parts being then forcibly separated.

The *spermatic cord* and *penis* may also be examined at this time.

THE UTERUS.—In private practice, this organ is not usually removed—unless absolutely necessary—on account of the vagina offering an outlet for the escape of fluids. If it should be removed, the vagina must afterwards be closed up. Note the size, position, consistence, etc., of the organ, and the appearance of the mucous membrane.

The VAGINA, FALLOPIAN TUBES, OVARIES, RECTUM, etc., may also be examined in this connection.

THE DUODENUM, LIVER, GALL-BLADDER, ETC.—The order of sequence at this stage should be as follows: first open the duodenum *in situ*, determine its contents above and below the papilla biliaris, which should be gently squeezed; and by pressure on the gall-bladder determine the presence of obstacles to the flow of bile and the presence of gall-stones. Slit up the ductus com-

munis choledochus, examine the vena cava, and remove the liver, taking care not to wound the right supra-renal capsule. Examine the external surface of the liver, make sections of it, and note the appearance of the acini, veins, and ducts. The hepatic may be distinguished from the portal vein by the pad of cellular tissue around the latter, in which run the artery and duct. The ligaments should be divided and the liver should be removed as the last stage but one of the abdominal examination. To remove it at an earlier period would be to wound the large veins and the diaphragm, the small omentum, the vena portæ, gall-duct, etc., besides interfering with the detection of obliterations of the vena portæ, defects in the perviousness of the ductus communis choledochus and of the cystic and hepatic ducts. If the thorax has already been opened, a portion of the diaphragm may be removed with the liver. The vena cava must be divided above and below, but the blood from it may interfere with any further abdominal dissection. Next open the gall-bladder and examine its contents.

THE STOMACH.—This organ may be opened *in situ* at the same time as the duodenum, by continuing the incision, except in cases of suspected poisoning. The spleen may be readily separated from it.

In a medico-legal case requiring removal of the stomach and its contents, tie the œsophagus and divide it above the ligature, before removing the lungs, etc. Then tie the duodenum and remove the stomach. Cut one of the ligatures and pour the contents carefully into a clean glass jar. Take all possible care by labelling and locking them up to see that no mistake is made as to the right jar and that they cannot be tampered with. They should never be allowed to go out of the physician's possession except personally into the hands of a chemist. Open the

stomach by carrying a pair of scissors along the lesser curvature. Note the thickness of the walls, their condition, and the appearance of the mucous membrane, taking care not to misinterpret the rugæ.

THE PANCREAS AND SEMILUNAR GANGLIA should next be examined. Any change in size, consistence, etc., should be noted; after which the *mesentery*, with its glands, vessels, etc., should receive the operator's attention.

THE INTESTINES.—These should be examined last, as, even with the greatest care, the operator, the instruments and receptacles, the subject, and the table are liable to be soiled. If there be valid reason for haste, they can be removed without injury to the other parts, except in the case of the duodenum, its removal being impossible without cutting through the excretory ducts of the liver and pancreas which open into it, and even wounding a portion of the pancreas.

If the intestines must be removed, place two ligatures at the commencement of the jejunum and the rectum and divide the bowel between them. Separate the large intestine throughout from its attachments, turn it over to the right side; do the same with the small intestines, and, taking the mesentery in the left hand, isolate them from their connections. Open them on the side that is attached to the mesentery.

In examining the intestines, note the state of the walls, the condition of the mucous membrane, particularly as regards inflammation, ulceration (how deep), perforation, the appearance of Peyer's patches, the mesenteric glands, etc.

The examination of the *retro-peritoneal lymphatic glands*, *receptaculum chyli*, *aorta*, and *vena cava inferior*, will complete the abdominal investigation.

EXAMINATION OF THE CRANIUM.

This examination is usually postponed until after that of the thorax and abdomen, but if it be especially important to examine the head, it is better to do so at once, as the division of the large vessels of the heart might change the appearance of the brain. The head being properly raised, and the hair parted across the vertex from ear to ear, an incision should be made down to the bone in the same direction—never across the forehead; the scalp being drawn forward over the brow and backward over the occiput. The knife is then passed all around the skull, through the temporal muscle, the line passing about an inch above the orbit, and half an inch above the occipital protuberance, and as high in the temporal fossæ as the shape of the head will admit. The operator should then saw the skull, standing to the left of the body, with the heel of the saw on the os frontis, and with a few firm and light movements cutting through the outer table, and continuing the cut backwards. The sawing must be thoroughly done at three points; the occiput and the anterior extremities of the temporal ridges on the frontal bone. The dura mater and brain must not be wounded.

The above is the usual method; but a better one, since it retains the calvaria perfectly in place without wires or other means, is to make the above horizontal cut from the forehead backward stopping at about an inch behind the ears; from this point on each side saw straight to the middle line to a point an inch higher than the level of the horizontal cut. If these cuts are bevelled at the expense of the inner table, additional security from displacement will be given. The scalp alone will retain the calvaria in place, and the forehead will not show the least evidence of mutilation.

The chisel and mallet may be used in hospital examination to penerate the inner table. In medico-legal examinations, do not use a hammer in such cases make no violent efforts to remove the skullcap, lest any fracture may be attributed to the violence. Examine the calvaria, and in medico-legal cases take off the periosteum in order to detect any fissured fractures. These may be made clear by ink, which will be absorbed into the fissure and cannot be wiped off.

As a rule, the exposed parts—dura mater, great longitudinal sinus, pia mater, surface of the cerebral hemispheres—must be first examined and described in succession; unless the dura mater should be adherent to the skullcap, requiring division before forcibly detaching the latter, and the removal of the skullcap with the dura mater adherent to it. Otherwise the parts may become crushed and injured, and accurate examination be rendered impossible. In new-born and young children these parts are usually adherent.

Having examined the membranes externally, they may be opened as follows: The dura mater, by passing the knife around the cut edge of the skull, the falx being exposed when the membrane is raised; the falx can then be detached from its connection with the ethmoid bone, and the tentorium, and removed, thus exposing the brain. Before disturbing the falx, however, open and examine the longitudinal sinus. Note the amount of cerebro-spinal fluid.

The Brain.—In the brain the incisions should be even and smooth, to avoid crushing, and always through the hemispheres, from within to without, so that the brain can be readily put together again, notwithstanding the number of cuts made in the internal parts. Make each successive incision across the middle of the existing cut sur-

face, and divide again and again each new half. This is not practicable with the large cerebral ganglia. The velum interpositum comes in contact with only a small streak, the stria or lamina cornea, and must be stripped off before commencing the dissection of these ganglia; the latter should be divided by fan-shaped radial incisions, whose common starting-point is the peduncle of the cerebrum, so that the relation of parts may be preserved.

After examining the membranes, a lateral ventricle should be at once opened partially as follows: Bearing in mind that between the middle portions (cellæ mediæ) of the lateral ventricles, there is only the very thin septum lucidum to form a partition-wall, and that it is exactly under the raphe of the corpus callosum, we make a lateral incision, at a distance of a millimetre from this raphe perpendicularly into the corpus callosum, coming directly into a cella media at a depth of two or three millimetres, the incision forming a right angle with the plane of the centrum semi-ovale. To open the anterior and posterior cornua of this ventricle, incisions must be made anteriorly or posteriorly, not vertically but horizontally—the anterior one higher, the posterior one deeper—in the anterior and posterior lobes of the brain. To remove anything from the ventricles, use only a small stream of water.

Having determined the contents of the lateral ventricles, the state of their walls and venous plexus, and the condition of the septum, the latter is taken hold of with the left hand close behind the foramen of Monro, the knife pushed in front of the fingers through this aperture, and the corpus callosum cut through obliquely, upwards and forwards, and then all these parts (corpus callosum, septum lucidum, and fornix) are carefully detached from the velum interpositum and its choroid plexus, and the vessels and tissue of the latter examined. Then passing

the handle of the scalpel from the front under the velum, so as to detach it from the pineal body and corpora quadrigemina, we learn the condition of the latter, and expose the third ventricle. With a long perpendicular incision divide the corpora quadrigemina and the cerebellum as far as the aqueduct of Sylvius and the fourth ventricle.

It may be necessary to make, both in the brain and spinal cord, a large number of cuts, even microscopic sections, to be sure that nothing has been overlooked. The fewer the abnormal changes, the greater the number of sections needed.

To Remove the Brain.—Lift up the anterior cerebral lobes and the first pair of nerves, divide the second pair, and internal carotid arteries, the third pair, the tentorium cerebelli,—the knife for this latter purpose being carried along the superior border of the petrous portion of the temporal bone,—dividing the fourth pair, and the others in regular order. The medulla oblongata and vertebral arteries are separated by passing the knife through the foramen magnum.

The arachnoid and pia mater of the base and sides of the brain, the lateral sinuses, and the fifth nerve with the ganglion of Gasser should next be examined.

THE ORBIT.—This cavity may be examined after removal of the brain, by carrying the saw through the os frontis, at the internal and external angles of the orbit, using the chisel to continue the cuts through the roof, and then tilting forward the portion of bone embraced in the section.

The Optic Nerve.—The posterior half of the eyeball can be readily removed, by a pair of scissors, without any disfigurement of the face, in order to examine the

condition of the optic nerve. It should be placed at once in Müller's fluid.[1]

EXAMINATION OF THE SPINAL CORD.

Make a longitudinal incision in the median line, and a dissection of the muscles laterally; then saw through the laminæ of the vertebræ. A double saw saves time. A chisel or a rachitome and hammer may also be used. Examine the spinal cord *in situ*. Note the amount of the cerebro-spinal fluid. If expedient to remove the spinal cord, note especially at what vertebra it is cut off, and remove the roots of the nerves along with it. Carry the knife outside of the dura mater, to cut through the nerves at the side, and the cauda equina below. Open the sheath and examine the cord itself on the surface, by sections, and by the microscope.

Transverse incisions must be made on the spinal cord, leaving the pia mater attached on the anterior and posterior surface, according as the incision has been made from the one or the other aspect. Müller's fluid may be used for the preservation of parts for examination, and these should be labelled.

To Conclude the Post-mortem Examination.—Remove all fluids from the cavities; replace the viscera; place some rags in the head to absorb the fluids; stuff the vagina or rectum, if either has been opened; fill in with bran wherever necessary, being especially careful to fill the pelvis, if this has been made necessary by the removal of its contents; replace the sternum, stitching it if it has been altogether removed; sew up the incisions; arrange

[1] Bichromate of potassium, gr. xxxv; sulphate of sodium, gr. xvj; distilled water, f℥iij.

the hair naturally; wash the body, and put everything in as good order as practicable, restoring the body as nearly as possible to its condition previous to the examination. The calvaria may be fastened by brass pins inserted into the diploë at each temple and at the occiput, to keep it in position, or by pieces of copper wire passed and twisted through holes drilled in each temporal fossa, and corresponding holes in the calvaria. In closing up the abdomen and thorax, sew from below, entering on the under surface of the skin, and at regular intervals.

The operator should be particular to cleanse his hands thoroughly with cold water, using a nail-brush, after which he must immerse them in some disinfecting solution, finishing his ablution with a little Cologne water. In case of wounds being received during post-mortem examination, he should wash the hands at once, suck the wound, and apply plaster until after the operation is over, then use water dressings. There is more danger from unseen cuts, of which the operator is hardly conscious, than from free incisions.

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